The Business Journal of Vegetation Management January 1980/$1.25

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WT&T

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WT&T OUTLOOK

There is something refreshing about starting a new year. It's like you were absolved of last year's foul ups and the load upon the conscience is lightened temporarily. In this case, we've been absolved of a whole decade!

I just wish bosses would hold off on budgets until the new year. Just think, when budgets were put together our bosses were feeling the load of ten years, not just one. Second best to a January budget would be a July to July fiscal year, since spring is always the strongest businesswise.

The Internal Revenue Service waits until January to send it's forms out. Perhaps it benefits from the early year optimism of taxpayers. Taxes and raises should coincide at the least.

Think of suppliers trying to get orders this past fall. Now is when they should looking for purchase orders.

The same goes for Green Industry salesmen. They should have their promotion out quickly and start seeking new business now while spirits are high. Don't wait until April when the blow of taxes is fresh.

It feels good to enter a new decade. Recession doesn't bother me. At least not yet.

WT&T LETTERS

Answer on topping could cause confusion

The answer provided by Dr. Funk on the question of topping trees could further confuse the already confused public and the agencies which serve them. Too often such recommendations are taken as blanket solutions to problems. There are always exceptions, in this case the 100 to 180 ft. Eucalyptus trees we contend with hanging over homes, power lines, etc. Often these trees will have a spread of 20 to 50 ft. between limbs, but authorities complicate matters with statements like "No spurs or climbing irons shall be used in the trees." Another one is, "All wounds over two in. in diameter shall be treated with tree wound dressing." There are exceptions which those of us who must do the work must contend with despite blanket statements by experts.

Howard Andersen
The Tree People
Pleasant Hill, Ca

Thank you for reminding us that rules are occasionally a hindrance. But, rules are intended to reduce confusion and differentiate between professional and nonprofessional work. Specifications should allow for regional differences, such as your Eucalyptus trees. They should also be kept current to developments in research.

Small associations needed

At the end of some long travels, I had the pleasure of coming back to the office and finding a tear sheet from your November issue of Weeds, Trees and Turf waiting on my desk. The tear sheet, of course, was your Viewpoint.

As you can well imagine, we absolutely subscribe to your conclusion that the smaller associations have an extremely important reason for their existence in this industry of ours. I think I know enough about the personalities involved in all of these organizations that I can honestly say they simply would not exist if they were not necessary. I am sure you agree with me that we work with a hard-headed group of businessmen in this industry regardless of whether they are involved in wholesale growing, retailing, landscaping, mailorder, arborists, lawn care, maintenance, or whatever. Each of the organizations that has developed during the past 15 years and those few that existed prior to the middle 1960's serves an extremely valuable function. Each causes a group of able individuals to give of their time, assets, and energy to seriously consider the problems and opportunities of a single segment of our industry. Each group allows individuals to serve on committees and boards of directors and rise to the presidency of an organization representing a branch of this industry of ours.

In the case of those associations (Wholesale Nursery Growers of America, Garden Centers of America, National Association of Plant Patent Owners, National Landscape Association, Horticultural Research Institute and the Endowment of the Horticultural Research Institute) which are administered by the staff of the American Association of Nurserymen, each can use its total assets toward the improvement of the segment it represents. Prior to the ex-

Continues on page 62

How Roundup® helped Jim Siegfried renovate this fairway in days, without closing it for one minute.

Take a good look at this good-looking fairway.

Last fall, Jim Siegfried found a way to clean it up, without tearing it up —at the height of his club's busy season. With Roundup® herbicide by Monsanto.

Jim is the Greens Superintendent at Losantiville Country Club, Cincinnati, where bermudagrass had become a serious problem on the 18th fairway. To control it, Jim applied Roundup once—while the weeds were still actively growing—right at the start of the Labor Day weekend.

"That's really 'prime time' here," Jim told us. "But after we applied Roundup, we kept the fairway in play the whole weekend, and after. The members played right over it, with no problem."

Since Roundup has no residual soil activity, and won't wash or leach out of treated areas to injure desirable plants, Jim simply took normal precautions against spray drift—and didn't worry about damaging desirable vegetation along the fairway.

Even better, he was able to reseed right into the dying bermudagrass only 7 days after applying Roundup—without loss of playing time or inconvenience to the membership.

Reinfestation won't be a big problem for Jim, either. He knows that Roundup destroyed the rhizomes of the treated weeds, helping prevent their regrowth.

Jim thinks he'll use Roundup again this year—and apparently some club members hope so, too. "As soon as they saw how good this fairway looks, some of the members started asking when I'm going to do the same for #10, where we have some more bermuda. I'll probably tackle that with Roundup this fall."

If controlling many tough emerged weeds and grasses is a problem for you, see your local Monsanto representative or chemical dealer soon for your supply of Roundup.

Roundup. It worked for Jim Siegfried. It can work for you.

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GREEN INDUSTRY NEWS

Plant propagators eye faster, regional production

Ornamental plant producers at the 29th Annual Meeting of the International Plant Propagators' Society, Eastern Region, were clearly interested in ways to speed up production of new, improved cultivars and to bring propagation back to the local nursery.

Questions following a number of papers actually took more time than presenting the papers.

Propagation by tissue culture, by cuttings, and by a British method known as chip budding received close attention from the audience. Grafting problems and dependence upon the Northwest for most liner material have Eastern growers searching for more closely controlled propagation techniques. Many hope developments in asexual methods will enable them to quickly and accurately develop their own regional cultivars.

Energy conservation and environmental control of propagation houses were topics also receiving attention by the audience. Producers were encouraged to look at construction characteristics and alternatives to keep a handle on energy costs. Dr. Bob McNeil of The University of Kentucky Department of Horticulture described a project using cave air as a source for ventilation.

Bruce MacDonald, Hadlow College of Agriculture and Horticulture, Kent, England, described developments in British propagation and production. One major development is called chip bud grafting in which a bud only is placed in a chip cut into root stock. MacDonald said the buds take better than normal whole grafts.

Doug Chapman, horticulturist for Dow Gardens in Midland, MI, discussed his work with maple cuttings. *Acer rubrum, Acer nigrum, and Acer platanoides* cuttings grew very rapidly under controlled conditions. Chapman also indicated some success using benomyl as a root stimulant, or perhaps as a deterrant to root rot.

Eight horticulturists spoke on their work with tissue culture. In this process, terminal meristem of terminal buds is removed in minute quantities, placed in special media in petri dishes, and five to ten stems ¼-in. to ½-in. long develop. Under this process vast numbers of individuals can be produced in less than three years.

By using tissue culture and cuttings, space needs for production become more in reach with the local or regional grower in the East. Many growers suspect that regionally developed and propagated cultivars would have better success than imported liners, that are grown to size at regional nurseries.

Large scale use of such methods is not likely, however, in the next few years. The interest is there, as evidenced by this IPPS show, and these methods will figure in the future of nursery propagation.

New engineering center for Charles Machine Works in Perry, OK, opened in November to develop and test new Ditch Witch underground construction equipment models. The 50,000 sq. ft. addition will house engineers working on drafting, testing and prototypes for eventual production.

TURF

Ohio show grows with lawn care

It's not that there is less interest in golf turf, it is that interest in lawn care oriented material has skyrocketed and made the Ohio Turf Foundation Show a major lawn care event.

The 1979 show was held in Cincinnati and attracted more than 1,600 turf professionals and 50 exhibitors, especially exhibitors with lawn care modified equipment.

A broad program provided delegates from Ohio and many other midwestern states with usable information for next season's challenges. The new Professional Lawn Care Association of America was a leading topic of conversation and PLCAA President Jerry Faulring was there to answer questions and to pro-

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If you don't need the high capacity of the Greensaire II, the smaller Ryan Greensaire 16 is a dependable alternative. It also offers the same choice in tine sizes. It's self-propelled too, so you can aerate up to 4,000 sq. ft. per hour.

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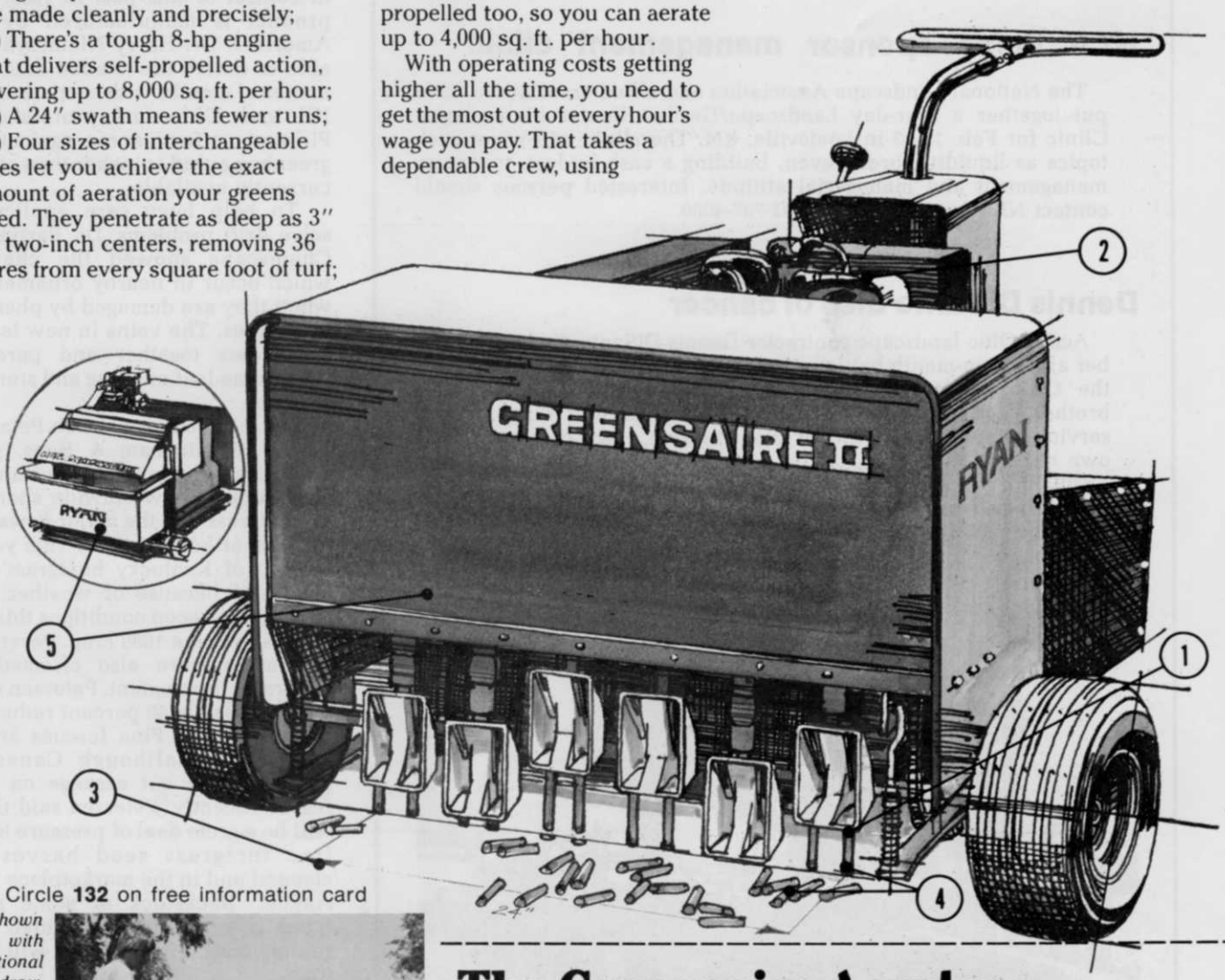

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LANDSCAPE CONTRACTOR NEWS

New ALCA officers nominated for 1980

Wally SaBell will head the Associated Landscape Contractors of America in 1980 and Allen Keesen, also of Colorado, will be president elect. Keesen is also chairman of the annual meeting in San Diego this winter.

Ritchie Skelton of Duncan Landscape Assoc. in Ohio and Ray Gustin III were nominated for vice president. Dave Pinkus of Dallas has been nominated as treasurer and Landon Reeve of Chapel Valley Nursery in Maryland as secretary.

The new officers will be elected and installed at the San Diego meeting.

NLA helps sponsor management clinic

The National Landscape Association and allied associations have put together a four-day Landscape/Garden Center Management Clinic for Feb. 10-13 in Louisville, KN. The clinic will cover such topics as liquidity, break even, building a cash budget, inventory management and managerial attitude. Interested persons should contact NLA immediately at 202-737-4060.

Dennis DiSanto dies of cancer

Active Ohio landscape contractor Dennis DiSanto died in December after a ten-month battle with cancer. Active in ALCA, NLA, and the Ohio Landscape Contractors Association, DiSanto and his brother George took their father's business and built it into a multi-service company, with indoor plant service, lawn care, and their own nursery.

DiSanto was a friendly and unselfish advisor to Weeds Trees & Turf and will be missed greatly.

Moving a 30-year-old Banyan tree down the Intercoastal Waterway near Miami Beach to its new home two miles away was the challenge of Ralph's Tree Service and landscape architect Jerry Peters. The tree was moved to the home of singer Julio Iglesias.

vide membership applications. There was obvious agreement in the lawn care sessions when need for protecting the image of professional firms came up. Representatives from ChemScape, Leisure Lawn, Barefoot Grass Lawn Service, ChemLawn Corp., and Hydro Lawn spoke during the sessions, in addition to turf specialists from Ohio State, Michigan State, and the Agricultural Technical Institute in Wooster, OH.

Ohio now has a local needs label for Pirimor 50W for greenbug aphid control which will aid considerably in control of this pest in 1980. The product is manufactured by ICI Americas. Dr. Harry Niemczyk was able to derive the needed data in a matter of months with cooperation of ICI and Ohio turf professionals. Pirimor's effectiveness against the greenbug aphid is higher than others currently available.

To help lawn care applicators solve drift problems, Dr. Partyka of Chemscape showed the changes which occur in nearby ornamentals when they are damaged by phenoxy herbicides. The veins in new leaves are closer together and parallel. Also, some leaf cupping and stunting is found.

On the seed scene, Bob Petersen of E.F. Burlingham & Sons, gave delegates a rundown on the status of seed supply. A worldwide shortage of bentgrass was the major news due to rains at harvest time. This year's harvest of Kentucky bluegrass was also poor because of weather, but growers had good conditions this fall for planting the 1980 crop. Perennial ryegrasses were also effected by long rains to an extent, Petersen said, with a possible 40 percent reduction in the harvest. Fine fescues are in good shape, although Canadian growers have cut acreage on fine fescue recently. Petersen said there will be a great deal of pressure to get fine turfgrass seed harvested, cleaned and in the marketplace next August. Backstock of some seed types is very short he added and replenishing this backstock will take time.

OTF goes back to Columbus next year under new leadership since Dave Martin has moved over to ChemLawn's Detroit office. Bob Earley, associate publisher of Lawn Care Industry magazine, was elected a trustee for his efforts in promoting the lawn care market.

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Or, the Bull, a high-performance 25hp diesel powered workhorse with dual-range 12-speed transmission and 4-step PTO (555, 774, 1025 and 1320rpm). With agricultural tires and 4-wheel drive for the construction site or landscaping job, or with wide turf tires and 2-wheel drive for the lawn or golf course, you get a lot of Bull at a practical price.

And the 38hp Stallion Ground Hugger. With power steering, nine-speed selective sliding gear transmission and 11-inch ground clearance, it's the state-of-the-art in special turf tractors.

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GOVERNMENT UPDATE

Payroll changes take effect this month

The wage base for Social Security and the Minimum Wage increase this month. Minimum wage is now $3.10 per hour and the wage base for Social Security has risen to $25,900 from $22,900. Check with your payroll people to assure compliance.

Benomyl gets conditional approval

Benomyl made it through Rebuttable Presumption Against Registration with two additional conditions; that a cloth face mask be worn during mixing and that large volume users mixing five or more lbs. at a time must be provided the product in water soluble bags. The valuable fungicide sold as Benlate, is manufactured by E.I. du-Pont de Nemours & Co.

Occidental fights groundwater dispute

The Lathrop, CA, facility of Occidental Chemical Co., a subsidiary of Hooker Chemical, has been named in a suit by the California attorney general for contamination of groundwater as a result of waste disposal practices.

Hooker President Donald Baeder denies any wrongdoing and promises to resist the "unwarranted" suit. No injury has been traced to the Occidental plant where DBCP was once made.

EPA grants to help urban lakes

Ten grants of $100,000 are being awarded to U.S. cities as pilot projects in an urban clean lakes program. EPA estimates that there are another 3,700 urban lakes which need help to avoid further deterioration. Decaying algae and aquatic plants are major targets of the program.

The target projects are:
Spy Pond, Arlington, MA
Weequahic Lake, Newark NJ
Lake Roland, Baltimore, MD
Lake Maggiore, St. Petersburg, FL
Park Lagoons, Milwaukee County, WI
Lake Pine Bluff, Pine Bluff, AR
Forest Park Lakes, St. Louis, MO
Sloans Lake, Denver, CO
Lake Merritt, Oakland, CA
Green Lake, Seattle, WA

Park air quality subject of enforcement

EPA has promised to crack down on air pollution sources which hinder use and enjoyment of parks and wilderness areas. Any source of air pollution near national parks of 5,000 acres or more should check ways to comply and avoid prosecution by EPA.

EPA calls for industry to induce own cleanup

The EPA has issued a "bubble" policy which should help industry cut costs by allowing it to figure out the best way to clean up air pollution at individual plants. Overall clean air requirements must still be met.

EPA Administrator Douglas M. Costle predicted that "This new, flexible approach to regulation will both stimulate the discovery of new control techniques and reduce the cost of regulation substantially. In the long run, both these results are critical environmentally."

PLANTS

Researcher recommends plastic for cold plants

A University of Maryland scientist believes nurserymen should roll out the plastic carpet if they want to make life easier for their plants during winter.

Dr. Francis R. Gouin, professor of horticulture, thinks the best way to pamper container-grown plants and prevent their delicate roots from being ravaged by frigid temperatures is to bed them down in a snug thermo-blanket of synthetic polyethylene or polypropylene.

The process, which results in substantial energy and money savings for commercial plant growers, is much more effective than and only a fourth the cost of conventional techniques.

Dr. Gouin has pioneered the use of foam plastics (commonly used in packaging and shipping furniture) to prevent winter injury to container-grown ornamental plants. He has spent the last 15 years studying winter hardiness of ornamental plants and a decade ago came up with the notion of insulating them in a plastic blanket.

Dr. Gouin inadvertently learned of the insulation value of microfoam, a polypropylene packaging substance manufactured by Du Pont De Nemours & Co., when he wrapped some ice cubes in it one day and forgot about it. Hours later, he found surprisingly little had melted. Gouin estimates that the use of the plastic packaging foam, which costs about 4 cents a square foot, results in wintering cost of about 6 cents a plant as opposed to about 25 cents a plant using conventional approaches.

PARKS

Volunteers can help Ohio directors told

Volunteers in the Hamilton County Park District (Cincinnati, OH) have learned about all aspects of park maintenance and functions and contributed a tremendous amount of help to the park system.

Continues on page 50

An EXCEL HUSTLER mower out-hustles any out-front mower any time, any place.

And does it mow! EXCEL HUSTLER 275, 285, or new 295 cuts the straightaway down to size with a smooth, even cut, up to 6' swaths.

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Does more than mow. Team an EXCEL HUSTLER tractor with attachments and it works all year long. Cuts all kinds of grass. Cleans dirt, litter, sand, leaves, etc. from walks and parkings. And what it does to snow is enough to warm a groundskeeper's heart!

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Naturally safer in design, both the 275 and 285 (and the new 295) have low center of gravity. Weight is focused over the drive wheels, and operator has unobstructed view of the front cut and trim edge.

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Our biggest offers you the MOST.

If your underground requirements are tough ones, take a look at the most Ditch Witch has to offer—the R100 Modularmatic unit—the most rugged, high-performance piece of 100-HP-class equipment available. Rough terrain or cross-country work, the R100 can handle it.

An exclusive frame-tilt feature lets you trench vertically on side slopes. Its rubber tires let you maneuver around the work site with little or no damage to surface areas. And four-wheel steering puts you into position easily.

The R100's front-mounted, six-way hydraulic blade makes backfilling or site clearance routine. Lock on an optional vibratory plow module and you can plow-in cable, tubing or plastic pipe.

Even our "least" is the MOST.

When your underground work falls into the light construction category, the least from Ditch Witch—the C77 handlebar trencher—offers the most work capability within its class.

The standard 20,000-pound-test digging chain on the C77, our smallest model, is comparable to that of larger trenchers. The controls are marked for quick identification and are located within easy reach of the operator.

A rugged 7-HP engine allows the C77 to take hours of tough use. Its compact size permits maneuvering through yard gates and around the tightest job sites. And loading is a one-person operation.

The MOST in little plows too.

When your smallest plowing requirements create the most problems, turn to the least from Ditch Witch—The VP12 vibratory plow—to clear that 36-inch backyard gate and get on with the job.

This self-contained, self-propelled, 4-wheel drive unit is a natural for close-quarter work. Its rigid frame permits the accurate and effective laying of cable, tubing or plastic pipe in the finest lawn.

The VP12's mechanically-driven shaker box makes maximum use of the plow's 25-HP engine. The standard plow blade provides a 12-inch depth with 10 inches of cover. Blades are also available for direct burying or pull-in.

No matter what your job requirements, Ditch Witch has the right machine to offer the MOST for your dollar. From the C77 and VP12 to the R100. And all the models in between. That's why we say "Ditch Witch is the MOST." And, at the very least, that's a lot!

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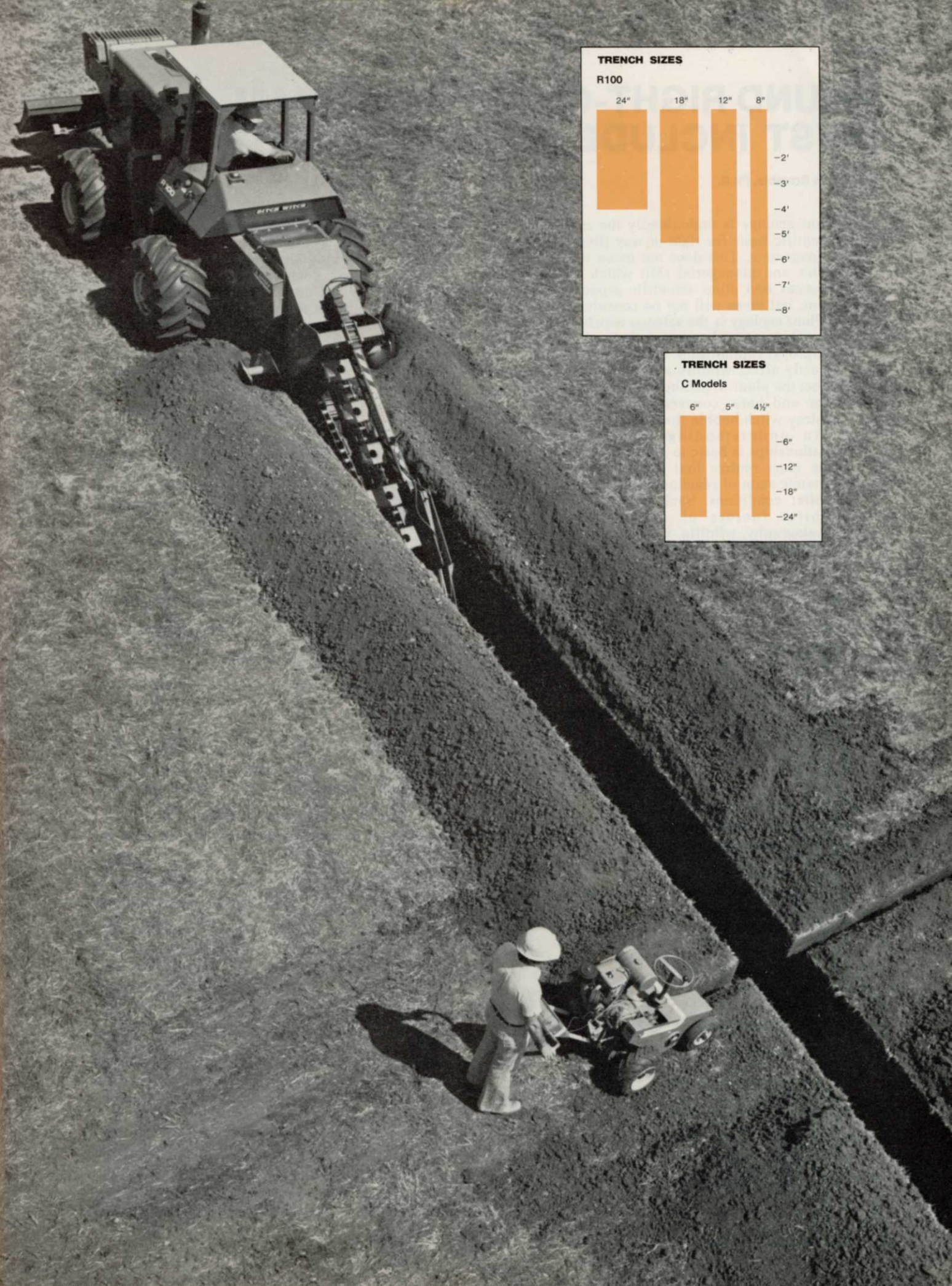
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SOUND RIGHT-OF-WAY PROGRAM MUST INCLUDE PLANT ECOLOGY

By William Bramble, Ph.D.

Plant ecology is undoubtedly the most important scientific basis for right-of-way (ROW) vegetation management. This does not mean to ignore economics and managerial skill which involve social sciences and other scientific aspects of management, but these will not be considered here.

Plant ecology is the science which treats of relations between plants and their environment—a reciprocal relationship. For example, a plant may directly affect wildlife and wildlife may, in turn, affect the plant. Witch-hobble may furnish food for deer and hare; conversely, deer and hare may destroy witch-hobble through excessive browsing.

An understanding of these ecological relationships is basic to sound ROW management. One must realize that ROW vegetation is in a dynamic state of reaction and adjustment to ROW habitat conditions. Such conditions include the habitat factors of climate, water, soil, physiography, wildlife, man, and other plants, all which makes for a complicated situation on ROWs.

To simplify and make something useful and understandable out of the complex ROW situation is the most difficult task in application of ecology to management. Often to help in this task, the use of the theory of limiting factors is employed to explain cause and effect. For example, animal destruction of weeds has been used to explain why trees do not reproduce in a scrub oak community. When this one factor was controlled, pine was established. In such a community on a ROW, a thriving small mammal population could be a limiting factor of value.

In another case, allelopathy was used to explain why black cherry did not reproduce on certain sites on the Allegheny Plateau where open orchard-like stands have persisted for 50 years without burning. Allelopathy refers to a release of biochemicals (phenolic compounds) into the environment by certain plants which has an inhibitory effect on the growth of neighboring plants. It was long held that heavy browsing by deer and hare, frosts, and herbaceous competition were the cause.

Now it is being suggested that allelopathic effect of dominant goldenrod, grass, aster, and fern is the chief limiting factor. Some of the common ROW plants which have exhibited this effect include: hayscented fern, New York fern, short huskgrass, ground pine, bracken fern, wild oat grass, goldenrod, aster elderberry and blackberry. Even the mosaic pattern of vegetation so typical of ROWs may be a result of allelopathy.

Another useful application of plant ecology is to recognize plant communities on ROWs which reflect the end effect of complex habitat factors. Plant communities are not distributed at random. When a plant species invades a ROW it becomes subject to habitat conditions which exist there and which determine its survival. Those species that survive form a plant community. To be useful in ROW management, plant communities would be easily recognizable at any season of the year (plant sociology blick). Fidelity, constancy, and cover value (dominance) are used to select characteristic species of a community. Where species distribution and grouping have not been previously described for a region, a preliminary group of characteristic species and communities may be recognized. These can be refined by later studies.

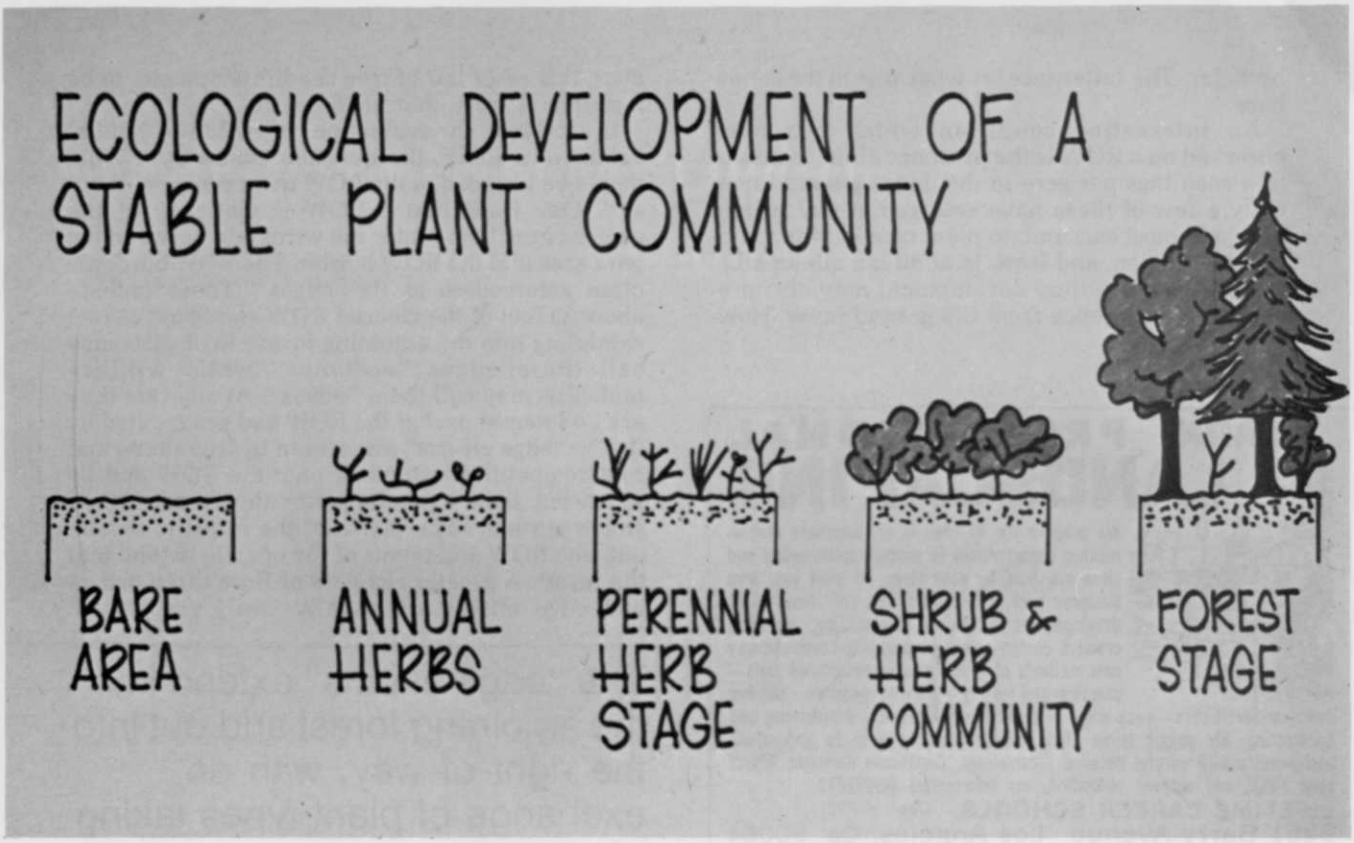
Chemicals released by certain plants may inhibit the growth of neighboring plants.

When using plant communities, the floristic composition is the primary criterion, with habitat and stage in plant succession not used to delimit a community. The characteristic species are considered to be the best indicators of a habitat. They also do reflect succesional trends when communities are arranged in order of their complexity from grassland to forest.

One of the leading tenets in an ecological approach to ROW management is the stability of shrub communities. The concept is that pure shrub patches on ROWs, once established and trees removed from them, are stable and resist tree invasion. Careful examination of this concept shows it to be true, although there are some exceptions. Many shrub patches of such species as blackberry and sweetfern are readily invaded by trees. However, pure patches of low blueberry on a ROW have been stable for at least 25 years where selective spraying has been used to remove capable trees. That utilities use such information is shown by the increase in selective spraying over the Penelec system and exclusive use of selective capable tree control by Metropolitan Edison.

Where shrub communities have persisted for many years, such as in scrub oak barrens, there is always a reason, usually a limiting factor or factors. In the case of a scrub oak barrens, fire and wildlife destruction of tree seedlings have been limiting factors. These have now been removed and the

Dr. William Bramble is Professor Emeritus of Forestry, Purdue University, West Lafayette, IN. For more than 25 years Dr. Bramble has performed research, served as a consultant to public agencies, and presented papers on the environmental impact of right-of-way management techniques. Dr. Bramble's paper was suggested to Weeds Trees & Turf by Hyland Johns, senior vice president, Asplundh, and presented originally at a recent major ROW conference. **WTT**



scrub oak is gradually changing to a forest with a scrub oak understory.

The sequence of events which takes place after a ROW is cleared through a forest has some very interesting ecological aspects which are also a key to what occurs on older ROWs.

In some cases, there is a sudden development of species typical of open areas not common in the forest. Blackberry has sprung up as if by magic following clearing of northern hardwoods, and this has been directly related to seeds deposited in the forest floor by birds. Many thousands of seeds have been deposited per hectare each year where they remain dormant and viable. Pin cherry has also exhibited a similar invasion and rapid development following forest clearing. It is no wonder then that ROW managers have experienced similar development of such plants following construction.

Under other circumstances, where an upland oak forest has been cleared the opposite has occurred. Plants common in the forest shrub and herb layers have developed after clearing to dominate the ROW for 25 years. They are the sole dominants for about five years. Subsequently, after about 10 years, plants of openings and open areas develop to become part of the dominant cover. They were probably present in the forest in small numbers and invaded disturbed areas on the ROW after clearance. This has produced the typical mixture of species found on older ROWs where plants of the former forest mingle with plants of open areas. The complex mixture is in a state of suspended plant succession by removal of capable trees in ROW maintenance.

This has been described as a combination of "relay foriatics" and "initial floristic composition"

Black cherry emerging from sweet fern in right-of-way.

by Egler. The latter means: what was there is now here.

An interesting condition which has been observed on a ROW is the presence of thousands of tree seedlings per acre in the dense ground layer. Only a few of these have emerged at any certain time and most succumb to plant competition, wildlife destruction, and frost. In addition, allelopathic inhibition of seedling development may also prevent tree emergence from the ground layer. However, this reservoir of tree seedlings appears to be a source of trees that need control.

In making an evaluation of wildlife habitat values of a ROW, the question comes up: "What should be included in the ROW in an ecological sense?" One finds that a ROW is made up of the cleared area both under the wires and between the wire area and the ROW border. The ROW border is often referred to as its "edges." These include about 33 feet of the cleared ROW and about 33 feet extending into the adjoining forest. Ecologists may call these edges "ecotones" while wildlife biologists may call them "edges." At any rate they are an integral part of the ROW and are created by it. The "edge effects" are caused by tree shade and root competition extending onto the ROW and by increased light extending into the forest, all of which permits some plants of the forest to extend onto the ROW and plants of the open to extend into the forest. A greater richness of flora often occurs and edge effects are usually easily recognized.

The "edge effects" extend into the adjoining forest and out into the right-of-way, with an exchange of plant types taking place.

Shrub borders are often encouraged along edges, which become important to wildlife and to visual beauty.

Probably the most valuable contribution of ecology to ROW management is that it leads to an understanding of what is happening on the ROWs. While there is no doubt that an alert manager already knows a great deal about this from experience, an understanding of ecological processes will add greatly to long-term management planning.

For example, the use of plant communities can help in predicting development of nontarget vegetation. Communities will also indicate the percent of a ROW occupied by major habitats. This information can be obtained from inventories needed for construction permits and from routine inspections of ROWs prior to maintenance treatments. A knowledge of the typical species composition of major plant communities will indicate the nontarget species that can be expected to occur on major habitats.

Application of the relationship between adjoining forest types and type-sites can be used to predict probable invasion of various capable tree species. While this will be affected by ROW tree removal in maintenance, a relationship will still exist.

Use of soil and topographic information on ROWs will aid in ROW management planning. County soil surveys can be used to predict probable soil drainage and erosion. Vegetation development on a ROW can be predicted from soil types combined with plant communities. In fact, a combination of soil with plant communities is an excellent key to ROW management planning. **WTT**

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2,4,5-T SUSPENSION REVEALS NEED FOR EQUALLY EFFECTIVE ROW CONTROLS

By Bruce F. Shank, Editor

The temporary suspension of 2,4,5-T by the Environmental Protection Agency has increased interest in other herbicides for right-of-way vegetation control. In anticipation of suspension and cancellation proceedings against Silvex and 2,4,5-T, and to compare the effectiveness of all registered products for right-of-way vegetation control, Asplundh Environmental Services conducted studies over the past four years.

Their report indicates that loss of 2,4,5-T would affect costs and would require consideration of new combinations of herbicides to accomplish acceptable vegetation control at a reasonable cost. Herbicides which achieve the same broad spectrum control as 2,4,5-T and are comparable in cost present new characteristics to consider such as persistence, unwanted control of desirable vegetation, or ineffectiveness on a few prime weed tree species. However, the report clearly indicates that the loss of 2,4,5-T, although significant, would not cause severe disruptions in current right-of-way spray programs.

Dow Chemical and formulators of 2,4,5-T are taking an aggressive stand against cancellation. Hearings get underway in February and EPA expects them to last a year or more. Therefore, renewed registration of 2,4,5-T is unlikely in the short term. One positive sign that Dow has good ground to stand on is that EPA's own Scientific Advisory Panel suggested that 2,4,5-T presented no significant risk to human health if protective clothing is used by applicators and uses are restricted to specific, low hazard areas, including rights-of-way.

It is clear that mechanical methods cannot replace chemical treatments entirely. Certain areas are not accessable to large clearing devices due to terrain factors. The helicopter equipped with application options has proven valuable for remote, large rights-of-way.

There are nonsuspended uses for 2,4,5-T. They include non-crop sites such as fence rows, vacant lots, certain industrial sites, and hedge rows. The herbicide may be used for these specific tasks until cancellation hearings are complete and a decision is final.

Registered herbicides to control woody vegetation.

Common Name	Trade Name	Manufacturer
amitrole	many	Amchem Prod. Inc.
AMS	Ammate	E. I. duPont
bromacil	Hyvar	E. I. duPont
2,4-D	many	
dicamba	Banvel	Velsicol
dichlorprop	many	Rhodia Inc.
fosamine	Krenite	E. I. duPont
glyphosate	Roundup	Monsanto
hexazinone	Velpar	E. I. duPont
picloram	Tordon	Dow Chemical
tebuthiuron	Spike	Elanco
triclopyr	Garlon	Dow Chemical

Alternative herbicides

According to Asplundh, the main reason 2,4,5-T has been the dominant herbicide in right-of-way weed control is the number of weed species it controls to an acceptable degree. In tests using basal and foliage spray methods, picloram, glyphosate, bromacil, and dicamba individually exceeded or matched 2,4,5-T in effectiveness. However, Asplundh reported unacceptable control of several prime weed tree species with picloram and dicamba when used alone. Glyphosate is comparatively expensive and bromacil at the effective rate is nonselective. As with 2,4,5-T, combinations are the key to the most effective control at the right cost. Therefore, other herbicides are needed to help control tough weed tree species such as ash, hickory and oak.

Before suspension of 2,4,5-T, a combination of picloram, 2,4-D, and 2,4,5-T was the most effective foliage treatment and a combination of picloram and 2,4,5-T was the most effective basal treatment, according to Asplundh.

Persistence is a problem with substitute herbicides. Picloram persists two to three times as long as 2,4,5-T and dicamba twice as long.

Glyphosate and fosamine both have potential despite limitations of cost and time of application.

Asplundh concluded in the event of a 2,4,5-T/Silvex cancellation, a combination of picloram with 2,4-D or dichlorprop or a combination of dicamba and 2,4-D or dichlorprop would be most logical.

Other herbicides fit specific situations most effectively. For example, AMS, glyphosate, and fosamine are safe to use on watersheds. AMS, although corrosive to equipment, is very safe and drift-free near sensitive crops. Sensitivity of crops to picloram is one of its drawbacks in addition to persistence. Nevertheless, picloram may very likely be the primary substitute for 2,4,5-T.

Since the Asplundh study, Dow has obtained registration for Garlon (triclopyr) to help provide control for tough tree species like ash and oaks. It is effective at selective rates and can be applied by high or low volume equipment or by helicopter. Dow intends to offer combinations with Garlon 3A for broad spectrum control.

Asplundh estimated that cancellation (or suspension) of 2,4,5-T will increase ROW maintenance costs by 42 percent over current expenditures, with electric utilities paying the brunt of the increase. This represents a $28.3 million increase overall and comes at a time of already rapidly escalating energy costs for consumers.

Perhaps the toughest prosecution against 2,4,5-T and Silvex is from self proclaimed human victims, not mice or laboratory animals. A school teacher who miscarried suspected dioxin contamination of stream water by nearby spraying in timberland. Over a three-year period she collected information on miscarriages in the area, and with a physician's help, submitted her report to the media, legislators, and the Environmental Protection Agency.

The issue then became an emotional one and one of the first to be supported by information on human suffering. EPA's Scientific Advisory Panel certainly had this data when they considered 2,4,5-T and Silvex and recommended that a ban was not required. Now, it is the manufacturers, users, and the Scientific Advisory Panel against the full power of the ecology band wagon. Hearings will begin in February to provide a judge with enough information to make a decision. And even if he rules not to cancel registration, EPA Administrator Douglas Costle can overrule. **WTT**

Relative comparison of effectiveness between 2,4,5-T and potential alternative chemical on woody vegetation based on data from Bovey (1977).[1]

	BASAL SPRAY			FOLIAGE SPRAY		
CHEMICAL	Number of Species Susceptible	Total No. of Species	% Control	Number of Species Susceptible	Total No. of Species	% Control
2-4-5-T	120	189	63	89	280	32
AMS	56	165	34	45	194	23
bromacil	135	169	80	53	73	73
2,4-D	44	152	29	58	258	22
dicamba	36	57	63	41	130	32
dichlorprop	16	64	25	20	117	17
glyphosate	—	—	—	73	75	97
picloram	55	66	83	84	155	54

[1]USDA Handbook No. 493, by Rodney Bovey (1977)

Relative comparisons of 2,4,5-T versus alternative herbicides.

Chemical	General Efficacy	Methods of Application	Cost Per Treatment	Advantages	Disadvantages
2,4-D	+[1]	=	=		
dichlorprop	+	=	=		
AMS	+	+	=	Safe on watersheds and near sensitive crops.	High rates required. Corrosive to application equipment.
bromacil	—	+	=		Leaches readily, injurious to desirable woody plants. Soil sterilant at rates needed for brush control.
glyphosate[2]	—	+	=/+	Safe on watersheds. No brownout with foliar application.	Only used in foliar season; nonselective.
fosamine[2]	—	+	=/+	Safe on watersheds. No brownout with foliar application.	Only used in foliar season.
dicamba	=	—	+		Best when used in combination with 2,4,5-T. More persistent.
picloram	—	—	=		Sensitivity of certain agricultural crops. More persistent.

[1] + 2,4,5-T is superior to alternative
= 2,4,5-T is comparable to alternative
— 2,4,5-T is inferior to alternative

[2] New herbicides, evaluation based on limited data.

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Grapefruit
Raspberries
Pecan
Walnut
Blueberry

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aligning rotor bearings have a diameter of 2½ inches. Drive is through a heavy-duty bevel gearbox and a cross shaft with double universal coupling to four final drive v-belts with self-adjusting tensioning.

The cowl is made from ⅛-inch mild steel plate; end plates are from ½-inch mild steel plate. For safety, the machine has 12 independent front steel flaps in ⅛-inch mild steel plate. A full width guard of heavy-duty, fabric-reinforced rubber is fitted at the rear.

The mower works well behind a tractor because its 72-inch width is approximately tractor size. This helps it maneuver well in confined spaces. (Circle **202** on free information card).

There are many other types of flail mowers to choose. These include Brillion Iron Works (**203**), Excel Industries (**204**), FMC, Agricultural Machinery Div. (**205**), Ford Motor Co., Tractor Operations (**206**), Hefty Tractor Co. (**207**), Hesston, Woods Div. (**208**), International Harvester (**209**), John Deere & Co. (**210**), and Vemco Co. (**211**).

Clearing devices

A fence row trimmer attachment on the Klearway, made by Kershaw, completely clears and mulches material growing in and above fences. It reaches straight up to 15½ feet or straight out 7 feet. With its powerful, high-speed rotary drum, it clears and mulches material 4 inches in diameter.

While the trimmer attachment clears fences above, the frontmounted cutter head clears brush and timber flush against the fence. The trimmer throws the mulched debris downward for safe discharge. Its side-mounted position gives the operator a complete view from his cab to do smooth, safe, and fast work.

When not in use, the fence row trimmer stows on top of the Klearway without disturbing the machine's stability or balance. (Circle **212** on free information card).

Bombardier Limitee, Industrial Equipment Div., makes the Muskeg Brush Cutter to clear and maintain rights-of-way where exceedingly soft terrain and swamps stop other types of vehicles. The large bearing area of the tracks provides a low ground pressure to allow this vehicle to work the year round over any type of terrain.

The Muskeg carries a 4-cylinder Detroit Diesel engine with a 212.4-cubic-inch displacement and 120 horsepower at 2,500 rpm. Power steering comes through controlled differential. Sixteen solid rubber wheels on tracks of rubber belts with steel crosslinks move the brush cutter.

The machine is 16 feet, 7 inches long, 100½ inches wide, and 90¼ inches high. Its ground clearance is 14 inches and frame height is 32 inches. (Circle **213** on free information card).

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This Woodsman features a diesel engine with

Continues on page 55

Muskeg Brush Cutter (top) by Bombardier Limitee. In the middle is the **Kershaw Klearway** also enables over-the-fence cutting. **The Woodsman** by Royer.

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INCREASED DIVERSITY NEEDED IN LANDSCAPE TREE SELECTION

By Douglas J. Chapman, Horticulturist, Dow Gardens, Midland, MI

A new monthly series intended to provide objective information on weaknesses and strengths of current and new urban plant materials.

A tree is often selected for planting with aesthetics or emotions playing the major role, rather than a clear understanding of the tree's potential or growing requirements. Similarly, a large number of trees are used because of familiarity, such as birch and elm, with little consideration of their maintenance requirements. In making planting decisions, one should understand the cultural requirements; disease, insect, and air pollution resistance or susceptiblity; and site requirements. With these concerns playing a co-equal role with aesthetics, there would be an increase in diversity of trees utilized in cities and home landscapes.

Many people have suggested Silver Maple (*Acer saccharinum*) is a "weed tree." This is not only an erroneous conclusion, but shows a clear lack of knowledge as to how the tree fits into our landscape. For many years, seedling Silver Maples were grown in the nursery for two years, then cut off, and allowed to grow back. This technique resulted in straight, high, well-branched specimens. Further, horticulturists who knew the requirements of this fast-growing, high maintenance tree pruned it every two to three years, resulting in smaller pruning wounds and less structural problems.

Presently, silver maples are pruned in five to eight year cycles, which often results in heartwood rot and structural damage. This clearly indicates that if Silver Maple is used on city streets, it will require constant preventative pruning and care rather than after-the-fact cosmetic pruning. The severe storm which hit the Central Michigan area during 1975 demonstrated that trees correctly pruned (this includes Silver Maple) were not as severely damaged from ice storms. The advantages of Silver Maple are obvious. It is fast growing and highly adaptive to urban conditions, with some selections developing outstanding fall color.

Doug Chapman manages the impressive Dow Gardens in Midland, MI. He has Bachelor degrees from the University of Massachusetts and Michigan State University in landscape operation and agriculture. He also has a M.S. in ornamental horticulture from MSU and Ohio State University. Before going to Dow Gardens he served as horticultural agent and county extension director in Flint and Midland, MI.

The American Elm (*Ulmus americana*) also adapts well to urban conditions and is a rapid growing tree, but is extremely weak wooded (falling apart in every storm), attacked by many insects (entire publications are devoted to its insect problems alone), and, of course, is subject to Dutch Elm Disease. The elm has been considered a highly desirable urban tree because of its familiarity to the general public. A study by Kalmbach and Kielbaso shows large trees (canopy over the street) were preferred by the majority sampled. The general public, as well as the professional forester, is willing to accept the millions of dollars spent on keeping the elm in a healthy, vigorous state. Contrast this with the Silver Maple — a tree with many of the same desirable characteristics, few insect or disease problems, yet is considered a "weed tree."

Selection of many landscape trees should be based on disease resistance or susceptibility. The crab apple, with its 600-800 available cultivars, is an outstanding tree when in full flower or heavily laden with fruit, but it is susceptible to apple scab and fireblight. There are some 80 cultivars showing good to exceptional resistance to these two diseases and these should be selected and grown.

When one completely reviews the literature, outstanding varieties, such as Malus 'Snowdrift,' 'White Angel,' 'Candied Apple,' 'White Cascade,' *M. tschonski*, and *M. floribunda*, should be high on the use list. When reviewing what trees are readily available in the trade, one sees M. 'Eleyi,' 'Van Eseltine,' 'Radiant,' 'Red Jade,' and others which are extremely susceptible to one or both disease problems. Many valuable trees are resistant to severe problems — White Oak (*Quercus alba*) to oak wilt, Norway Spruce (*Picea abies*) to cytospora canker, Ruby Red Horsechestnut (*Aesculus carnea 'Brioti'*) to bacterial leaf blight — and should predominate a list of low maintenance trees.

The homeowner and commercial applicator should use tolerance or resistance to insect attack as a consideration in making a planting decision. With today's understanding of use and limitations of pesticides, one should be diversifying the landscape rather than making planting decisions which require a continuous insecticide application. In the Central Michigan area, White Birch (*Betula papyrifera*) is almost deitized, being used in 60 percent of the landscapes, yet only recently has there been extensive research to replace this outstanding native with borer and miner resistant trees; i.e. Monarch Birch (*B. maximowicziana*), River Birch (*B. nigra*), and Japanese White Birch (*B. platyphylla japonica*). There is still a place for White Birch in the landscape, not only in the more northern areas of the Northeast but in southern areas. The planter should know that this is a short-lived tree and requires constant applications of insecticides to protect it against the ravages of these two insects. If one is clearly informed as to how a tree responds in a part of the country, then knowledge-

Norway maples (left) adapt better to urban soils than sugar maples.

Sugar maple (left) requires fertile, well-drained soils. **Silver maple** (above) requires constant pruning and care.

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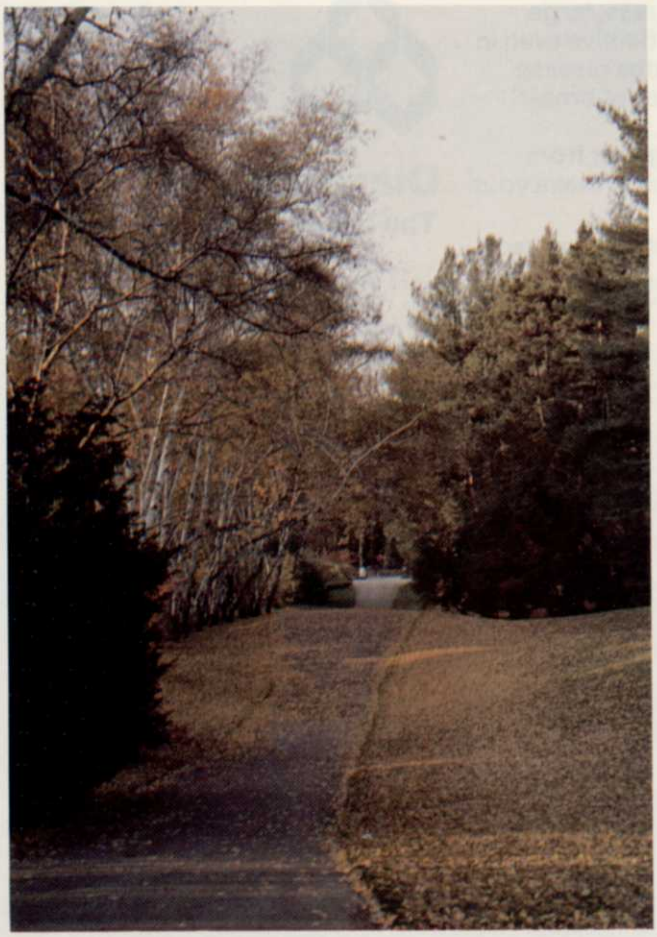
able decisions to plant River or Paper Birch (*B. papyrifera*), elm, or hackberry can be made.

The plant's ability to tolerate air pollutants, such as sulfur dioxide, ozone, or sodium chloride laden air, is an important factor when making decisions on plant types. Austrian Pine (*Pinus nigra*), a two-needle pine, tolerates pollutants much better than the five-needle pines, i.e. White Pine (*P. strobus*) and Bristlecone Pine (*P. aristata*).



Planting sites should also be considered for their impact on trees. The native Sugar Maple (*A. saccharum*), which thrives on fertile, well-drained soils, does not adapt to the poorly drained, heavy clay urban soils as well as Norway Maple (*A. platanoides*). If one has a large open site with fertile, well-drained soil, Sugar Maple, for its habit of growth and fall color, is clearly more exciting than Norway. Site not only dictates tree size and shape but also adaptive type. Many trees are planted on droughty soils on outlawn conditions with little regard to their ability to withstand this rigorous environment. Sugar Maple collapse and beech predisposition to borer attack make these trees less desirable to White Oak, English Oak (*Q. robur*), Silver and Red Maple (*A. rubrum*), 'Bradford' Callery Pear (*Pyrus calleryana* 'Bradford'), and cultivars of Honey Locust (*Gleditsia triacanthos*).

One should also consider plant compatibility. Rhododendrons are exciting when growing among pine trees, yet quickly die when planted among maples. It is akin to the frustration of trying to grow a quality turf under a Sugar Maple or the ease of cultivation under Honey Locust.

Every tree has conditions which make it the outstanding selection. It should be paramount when making landscape plant choices to increase the diversity of trees grown while eliminating the classification "weed trees." A tree is only a "weed tree" when we don't understand the maintenance requirements, where or under what conditions the tree thrives, or aren't able to provide the correct level of maintenance. Each tree from Tree of Heaven (*Ailanthus altissima*) to Silver Maple, crab apple, Ruby Red Horsechestnut, or White Oak has different maintenance requirements but each fills an important niche in our total overall landscape.

WTT

Aesthetic value (above) is only one of many considerations in plant selection.
Eighty crab apple cultivars out of 800 show resistance to apple scab and fireblight.

HOW TO DECREASE EROSION BY NATURAL TERRAIN SCULPTURING

David J. Barr and John D. Rockaway, professors of Geological Engineering, School of Mines and Metallurgy, University of Missouri, Rolla.

There is a natural tendency for all of us to think of "ideal" landscaping as a flat, smooth, or uniform terrain surface. A close look at any natural terrain surface, however, will not support such a perfect concept of the land.

It is assumed such smooth uniform surfaces are in harmony with nature. Subdivisions, parks and other constructed landscapes are often made as free of irregularities as possible.

We suggest that attempts to construct landscapes that are smooth, uniform and perhaps visually pleasing actually contribute greatly to increased erosion and subsequent sedimentation.

Rather than trying to hold the soil in place, it may be more realistic and cost effective to sculpture the terrain into a form and shape that would approximate a natural surface at equilibrium. Application of such a sculpturing technique might range from large scale surface mine reclamation or subdivision design to small half acre units feeding into an existing watershed.

Take a look at any natural terrain surface and the drainage system which evolved to carry away runoff water. It will include rills and gullies near the tops of slopes integrating downslope into permanent channels and trunk systems. Side slopes will be concave in shape with steep gradients near ridge crests and flatter slopes in the tributary bottoms. Although relief within a watershed may vary from a few feet to hundreds of feet, natural landscapes are seldom smooth and uniform or without irregularities.

Slope geometry

Numerous studies involving field and theoretical laboratory work indicate that natural terrain slopes most often can be classified as concave, convex, uniform or complex in shape.

It is accepted by observation and theory that the concave shape is most stable and in near equilibrium with precipitation runoff that would tend to produce sheet erosion. In fact, a convex slope shape will ultimately erode to a concave shape and the complex and uniform shapes probably represent traditional profiles. As figure 1 shows, a great volume of material has the potential to erode.

Attempts to construct landscapes that are smooth and uniform actually contribute to increased erosion.

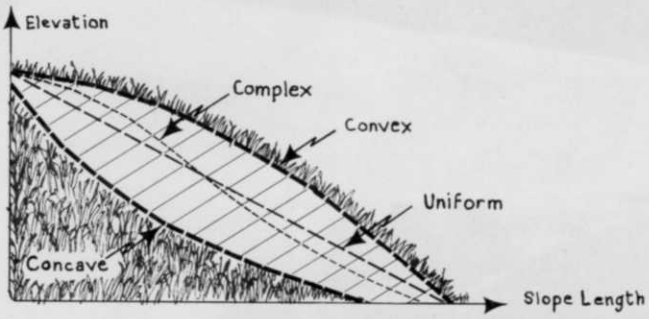


Figure 1 illustrates (top) quantities of erodable material with various slope shapes.
Severe initial erosion on a smooth graded slope prepared for a development.

Studies indicate that the concave shape yields the least amount of sediment through erosion to a stream. The steepness of the toe of the slope (that portion at the lowest elevation) is most significant in affecting the rate of erosion and sediment yield. Most man-made landscapes are created with convex or complex slope shapes thus creating a natural tendency for sedimentation and erosion.

Drainage design

Any land surface which has been altered by man will, with time, develop a drainage network sufficient to carry the discharge from the area. The network will be characterized by its drainage density, which is the cumulative length of channel segments in a unit of area, usually per square mile. These channels are distributed in a random veinlike pattern unless manmade controls are exerted upon the system.

An inspection of an area prior to disturbance will give some indication of tendency to erode. For large areas this may be most practical by aerial observation. The higher the density of channels the more likely the surface will erode. Factors which

Aerial view of site developed for building shows erosion beginning on smooth slopes. Note rills forming.

may play a part in erosion are the shear strength of the soil, the slope of the hillside, the rate of flow of runoff, and shape.

Naturally occuring drainage densities vary across the United States. The Coastal Plain of Virginia has a drainage density of 6 mi./sq.mi., while the Badlands of New Jersey (Perth Amboy) have a drainage density of 650 mi./sq.mi. Other examples are the Appalachian Plateau of Kentucky with a drainage density of 56 mi./sq.mi. and the Coastal Range of California with a drainage density of 35 mi./sq.mi. The glaciated areas of north Wisconsin have a drainage density of just 1.5 mi./sq. mi.

Concave slopes yield the least amount of sediment through erosion to a stream.

These densities were taken from areas where the forces giving rise to channel development are in dynamic equilibrium with those forces resisting initial channel development. It is generally accepted that the drainage density remains relatively constant throughout a watershed.

Some basic characteristics of drainage densities are:

— as soil shear strength decreases, drainage density increases.

— as average slope increases, drainage density increases.

— as runoff rate increases, drainage density increases.

Applications

Although none of the concepts presented have been evaluated for economic practicality, there is strong evidence that reclamation and landscaping could be improved by making reclaimed surfaces more nearly the shapes of natural surfaces. Initial grading for creation of concave slope profiles and well-defined, randomly oriented channels could reduce the potential for natural erosion to carve these shapes.

Also, the drainage on previously reclaimed mine areas or landscapes could be modified to induce more randomness in drainage as well as concave slopes and thus reduce natural erosion. Further study might lead to tested values for desired terrain characteristics, but at present a sculptured terrain could be designed using a combination of theoretical and artistic interpretation and inference.

Continues on page 34

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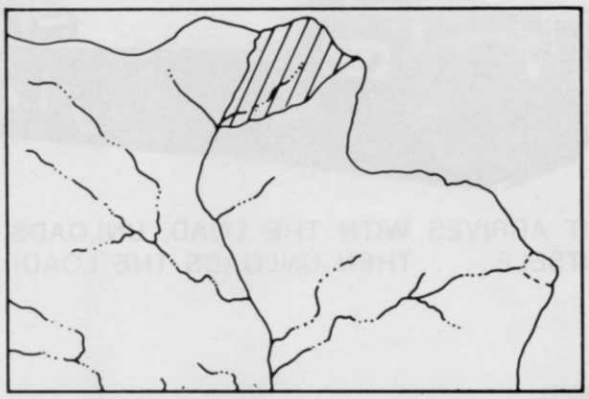
Erosion *from page 32*

The following steps, if undertaken, would tend to cause land to be more natural in shape and consequently less prone to severe initial erosion:

Runoff area design — The smallest area which supports the creation of a channel high in the drainage network can be estimated. This area should be approximately the same before disruption and afterward in a manmade drainage network.

Drainage density — Design of drainage density should include the appropriate drainage density for the site. The drainage layout could best be sketched in a naturally appearing random (veinlike) branching pattern. A first approximation to the required drainage density could be measured from pre-disturbance maps and photos and then increased slightly for effects of disruption.

Drainage channels should be constructed to resemble natural channels. All channels should grade from shallow (0.5 ft.) at the head end to several feet deep for trunk collector channels. Top bank widths should range from perhaps 12 ft. wide for small tributaries to broader channels in the trunk stream. The gradient of the channels should be steepest at the head end with flattening toward the mouth of the primary trunk stream.



Random drainage pattern common to undisturbed land.

Slope profiles — In the process of creating drainage channels some effort should be taken to sculpture the land into concave shapes where possible. Similar shapes within watershed areas would tend to reduce severe initial erosion. Exacting mathematical formulas using the above criteria are available for those interested from the authors, 125 Mining Building, Rolla, MO 65401. **WTT**

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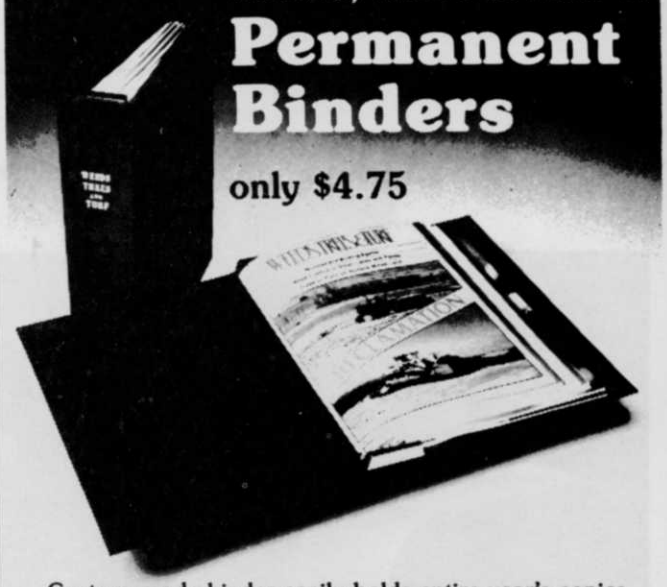

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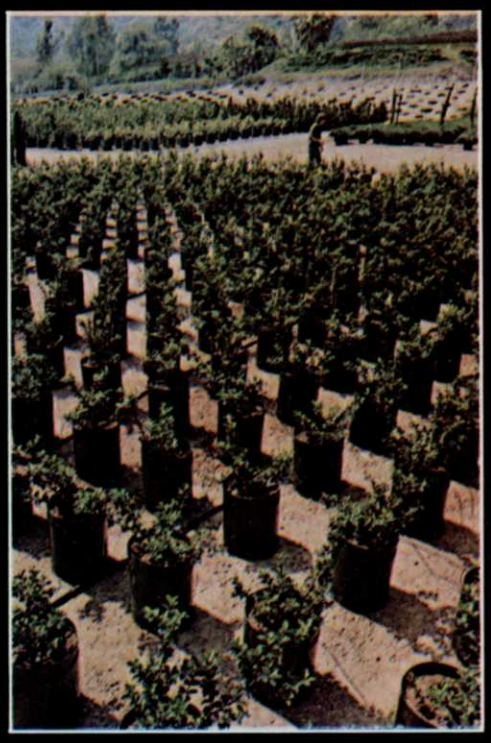

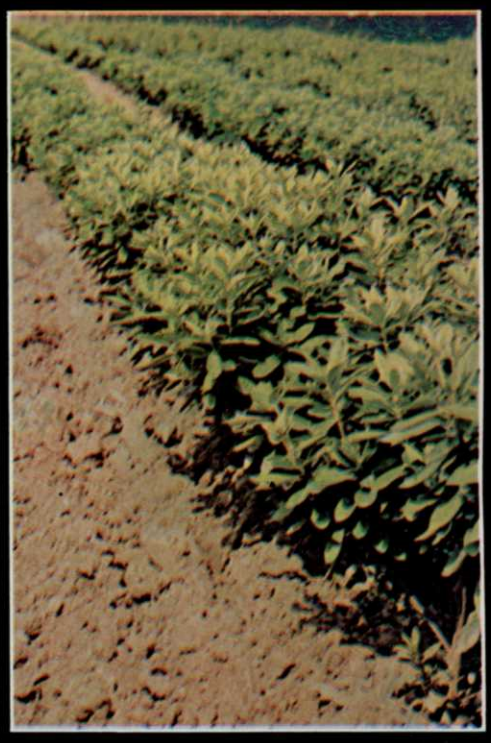

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1979 MARKET DATA INDICATES FEBRUARY IS BIG BUYING MONTH

February is a big buying month for landscape contractors according to "Pulse Reports" tabulated by the research arm of the Business Publications Division of Harvest Publishing Company, of which Weeds Trees & Turf is a part.

Monthly or quarterly questionnaires were sent during 1979 to obtain indications of market surges or unrest. We were very interested in indications of cutbacks caused by anticipated recession. Third quarter 1979 figures did not reflect any such withdrawal from the marketplace.

As recession is a loose term which can cause major waves in the economy, we will continue to survey Green Industry markets in 1980. The definition of recession is two consecutive months of drop in Gross National Product. Such an occurence is likely in mid-1980. The real key to a recession is the size of the drop in GNP, not merely the fact that it dropped at all. If consumers react as they should to counter inflation, there will be recession. They are reacting now against automobile prices, energy prices, and the cost of borrowing. These factors will create conditions which can be interpreted as recession, but may not represent all factions of business. Few recognize this and therefore will respond with very conservative spending for all items. As a result, it is up to each healthy market to sell its positive growth individually, customer by customer. The Green Industry is a positive growth market which needs to get its message of growth to consumers right away.

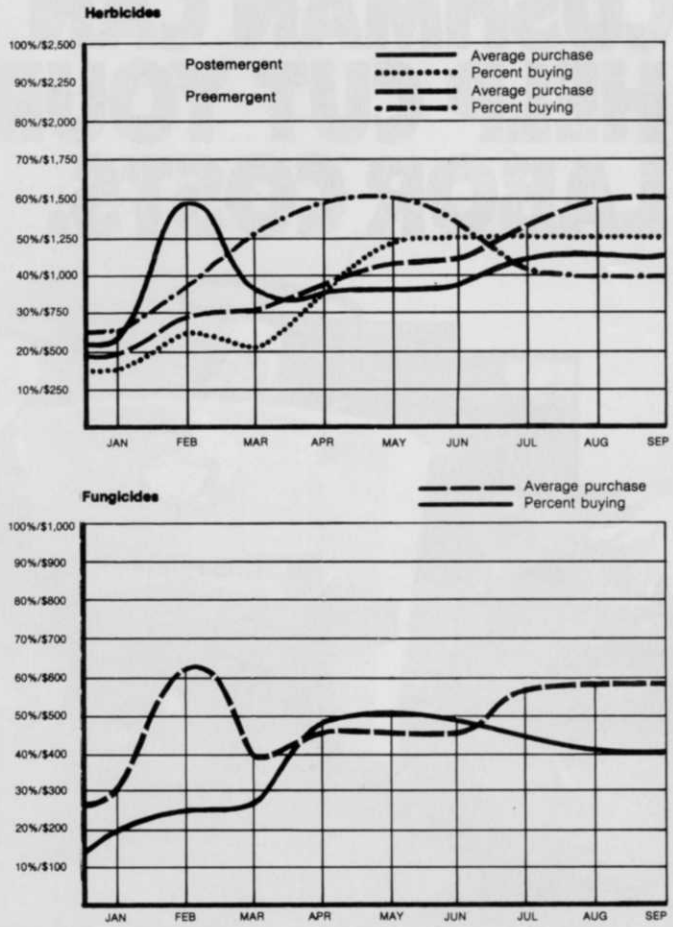
The February results to our surveys may show us a great deal about 1980. Landscape contractors must at least cover what they have on the books for the coming season. If they anticipate cancellations it will be evident in the February figures. Unfortunately, we won't be able to research, tabulate, and publish the returns until April. We will let you know as soon as possible in any case.

Basically, good accounts will stay and iffy accounts will hedge and possibly drop temporarily. It is important to categorize these different types of accounts early. At the same time you should maintain constant communication with your supplier as to his purchasing plans. Let him know what you need as early as possible.

At the same time, more people will be staying home and making carefully thought out additions or improvements to their property. You will have to have answers if you want their business. You will need examples to show them and data to support the return on investment of landscaping. Offer, if possible, things like 90 days same as cash through local finance companies, installation as soon as possible after a decision, and multi-year improvement plans to spread the cost of major improvements over two or three years.

To sell more effectively, you must have good sales aids such as color before and after photographs and sales figures of real estate following landscape improvement, and both within the practical reach of the customer to which the sales effort is directed.

In fact, since residential real estate is moving so slow, a good relationship with realtors may return be a good idea to move homes needing landscape alterations.



Graphs show jump in percentage buying and average purchase in February.

Other observations

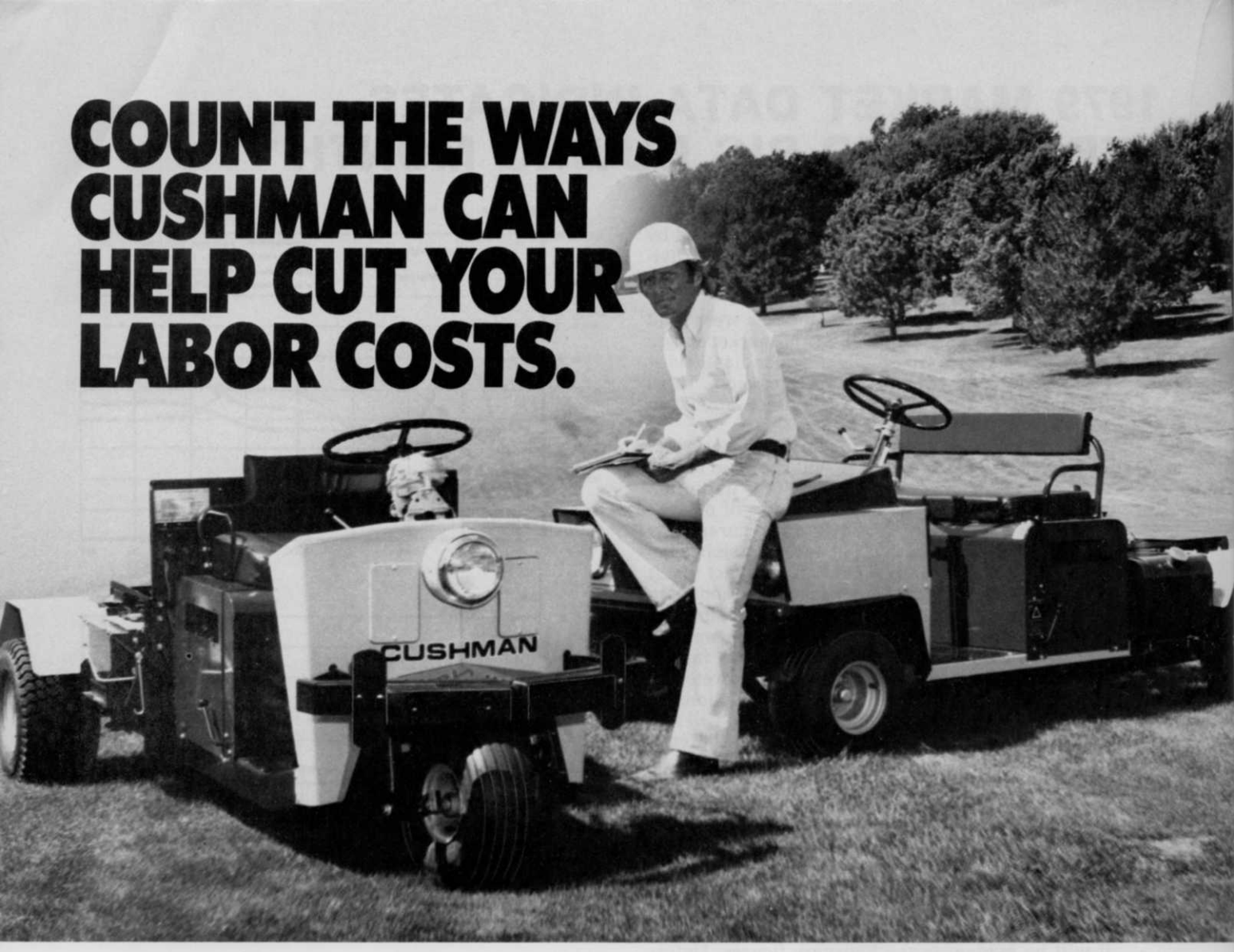
At the time of writing we did not have fourth quarter figures back yet. For the first three quarters of 1979, the months of February and April showed the biggest jump in purchasing for landscape contractors. The February purchase involved a lower percentage of buyers, but the average size of purchase was high.

One suprising result was that fungicide and insecticide buyers were lower in percentage but higher in average purchase in the third quarter. Perhaps the did not anticipate the amount of disease and insect control business as they received in the summer of 1979. The data could have been influenced by higher than normal disease and insect problems in a particular area in 1979.

The most popular mower in 1979 was the self-propelled rotary, by nearly five to one over reel.

Continues on page 53

COUNT THE WAYS CUSHMAN CAN HELP CUT YOUR LABOR COSTS.



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The Greensaver lets you aerate greens, tees or other turf areas up to 10 times faster than walk-type units.

It attaches easily to either the 3- or 4-wheel Turf-Truckster. Choose the drum best suited for your turf: ½" coring tines, ⅜" coring tines or slicing tines—they are all interchangeable. What's more, both coring drums collect cores as you aerate. Or remove the side plates and return the cores to the turf to be broken up as top dressing.

2. SHORT BOX & FLATBED/BOX.

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3. SPRAYER.

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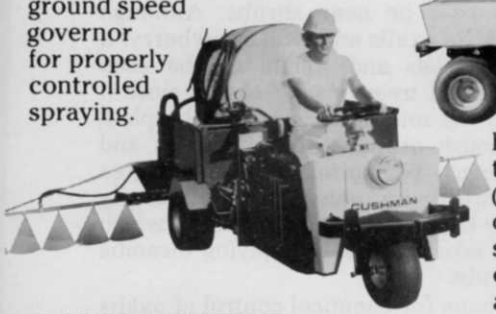

4. TOP DRESSER.

Compared to self-powered or walk-type top dressers, this unit pays for itself in the hours it can save your crew. A rubber fabric moving bed and rotating brush are regulated by

the vehicle's ground speed to maintain an even spreading pattern over a 31½" swath. And the hopper holds up to 1,000 lbs. of material from rock salt to powdered fertilizer.

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ALTERNATIVES TO SILVEX FOR BROADLEAVED WEED CONTROL

By Thomas R. Turner, Extension Turf Specialist, University of Maryland, College Park, MD

The Environmental Protection Agency has temporarily suspended many uses of silvex (2, 4, 5-TP), including virtually all uses on home lawns, golf courses, and other turfgrass areas. Because of this ban, many questions have been asked concerning broadleaved weed control in turf, especially relating to alternatives to silvex. The University of Maryland Agronomy Mimeo 79, "Weed Control in Established Bluegrass Lawns," which describes broadleaved weed control in turf, is no longer distributed due to its recommendations for silvex use and is currently being revised.

Most broadleaved weeds which were controlled by silvex can be controlled by either 2,4-D, dicamba, MCPP, or a combination of two or all of these materials. Chemical alternatives to silvex for some of the broadleaved weeds commonly found in turf are shown in Table 1. Often, combinations of the herbicides listed in Table 1 provide better control than the individual herbicides alone.

The weeds for which silvex was formerly recommended and about which most questions have been asked include white clover, the chickweeds, black medic, henbit, ground ivy, oxalis, wild strawberry, and violets. Use of 2,4-D will not control these weeds. MCPP will control white clover and the chickweeds, but higher rates and repeated applications are needed for what may be marginal control of black medic, henbit, and ground ivy. MCPP will not control oxalis, violets, or wild strawberry, which presents a special problem when growing under trees or near shrubs. Although dicamba will control oxalis and wild strawberry, it will not control violets and should not be used under the drip line of trees or near shrubs since it moves readily in the soil and is absorbed by plant roots. Thus, although oxalis, wild strawberry, and violets could formerly be controlled to some degree by silvex, these weeds are now considered mearly uncontrollable by home lawn care companies, which cannot afford to take the risk of applying dicamba near trees or shrubs.

One possible hope for chemical control of oxalis in shady areas is Ronstar (oxadiazon), which is labeled for preemergence control of oxalis. Also, some alternatives to silvex for these difficult to control weeds may be found in current research which is being conducted to further study the effectiveness of various combinations of 2,4-D, dicamba, MCPP, and other less commonly used materials such as 2,4-DP. However, due to the difficulty that has been encountered in chemically controlling many broadleaved weeds, which has been compounded by the restrictions placed on silvex use, new emphasis needs to be placed on non-chemical methods of control, especially management practices.

Many steps can be taken to reduce the dependence on the use of herbicides for broadleaved weed control. The most effective means of control of any weed is to prevent the weed from becoming

Continues on page 47

Table 1: Alternatives to silvex for chemical control of broadleaved weeds in bluegrass and fescue turf.

Weeds Controlled By Silvex	Alternative Means of Chemical Control
black medic	dicamba
buttercup (creeping)	2,4-D*, dicamba*
carpetweed	2,4-D, dicamba, MCPP*
chickweeds	dicamba, MCPP*
chicory	2,4-D, dicamba, MCPP
cinquefoil	2,4-D*, dicamba*, MCPP*
clover (white)	dicamba, MCPP
daisey (oxeye)+	dicamba*, MCPP*
dandelion	2,r-D, dicamba, MCPP
dogfennel	2,4-D*, dicamba, MCPP*
ground ivy+	dicamba*, MCPP*
henbit	dicamba, MCPP*
knawel	dicamba, MCPP*
mallow (common)+	2,4-D*, dicamba*
oxalis (yellow woodsorrel)	dicamba*
pineappleweed+	dicamba, MCPP*
purslane	2,4-D*, dicamba
violets+	———
wild carrot	2,4-D, dicamba, MCPP*
wild strawberry	dicamba*

+ Usually required more than one application of silvex for fair to good control.
* May require repeated treatments for fair to good control.

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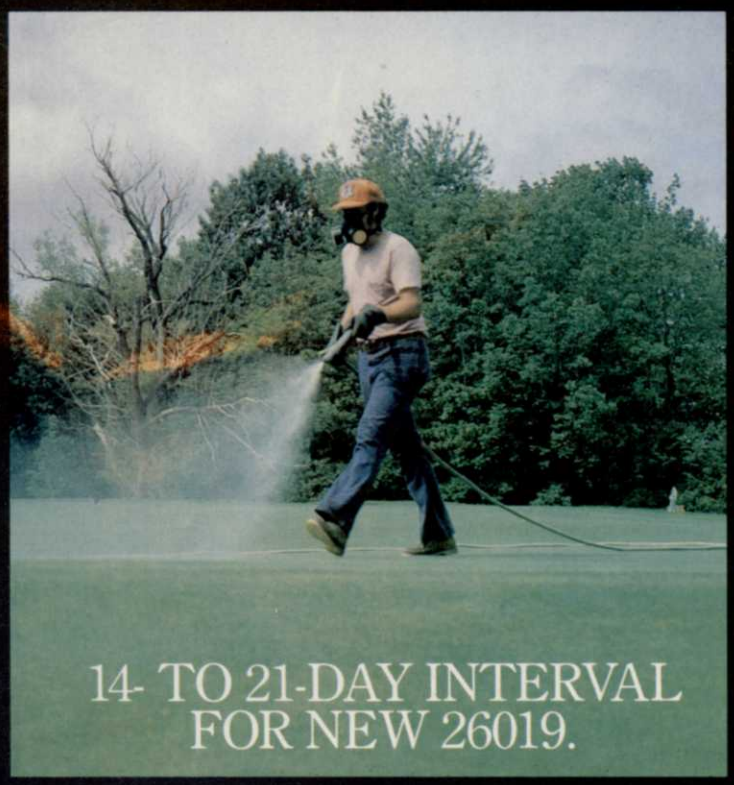

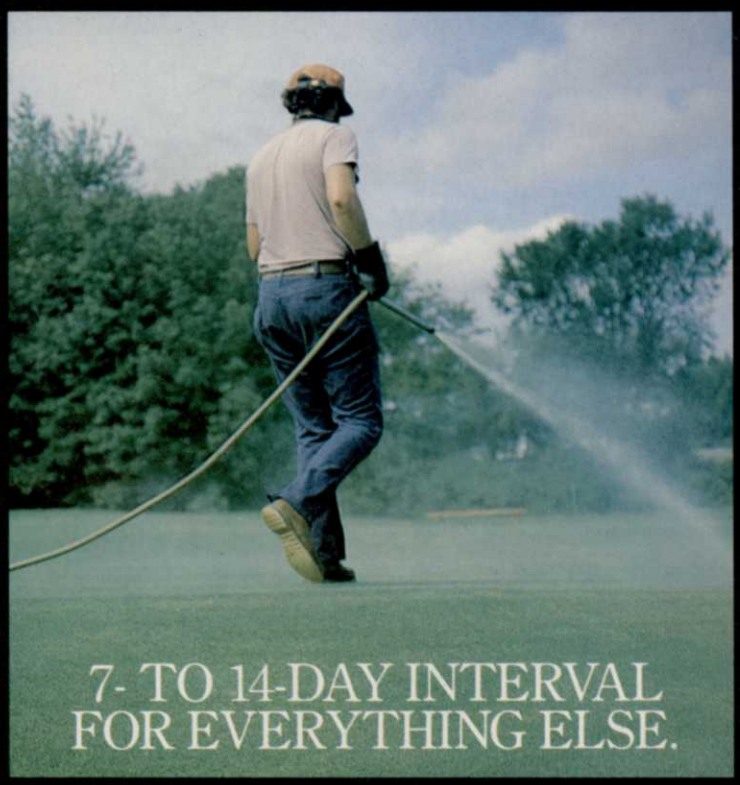

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—Bob Dickison, golf course superintendent
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—Paul Boizelle, golf course superintendent,
and John Fenwick, foreman,
Fiddler's Elbow Country Club, Far Hills, N.J.

"We started using Chipco 26019 in June of 1977. Before we started using it, we had very little luck with our other contact and systemic fungicides in certain areas. We were applying some contact fungicides at preventative and curative rates, and still only getting two or three days control, with the usual cold fronts coming through, followed by large outbreaks of dollar spot. Since we started using Chipco 26019, we haven't found dollar spots in these areas at all."

—Randy Wahler, golf course superintendent
Glen Flora Golf Course, Waukegan, Ill.

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Regal's color advantage is apparent on the No. 5 hole at the Broadwater Beach Hotel's Sun Course, Biloxi, Mississippi. Regal on the right. A leading competitive grass on the left.

into spring, and through the spring transition. While the turf quality of other ryegrasses decreases in the spring, Regal maintains superior quality while yielding to bermudagrass, for a smooth transition.

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Alternatives *from page 42*

established in the first place. Thus, proper turf-grass establishment is important in preventing future weed problems. Steps that can be taken include:

Buy good quality seed. Poor seed, containing varieties not adapted to your area, will ultimately result in a poor turfgrass stand which will enhance the chances of weeds becoming established. Buy certified seed of varieties adapted to your particular state.

Seed at the proper time. Seeding during stressful periods results in a poorer turfgrass stand and thus less competition against weeds. Also, conditions for germination and growth of many weeds are more favorable at other times of the year.

Fertilize seedbed according to recommendations. Too little or too much lime and fertilizer will result in poorer turfgrass establishment and thus more weeds. Soil should be tested to determine the proper amount of liming material and fertilizer to apply.

Any other management practice, such as proper mulching and watering, which encourages vigorous seedling growth and thus increases competition against weeds should be used.

Many of these same principles apply to established bluegrass and fescue. Management practices which encourage a vigorous and dense turfgrass stand will help reduce the chances of weed encroachment. Proper mowing, watering, and fertilization are critical. Grass mowed too close or not frequently enough (which results in too much of the grass plant being removed at one time) results in a poorer root system and less competitive turf. Frequent, light watering can result in a shallow root system and more disease susceptible turf and thus a less competitive turf. Also, a continually moist soil surface encourages weed seed germination and provides a more favorable environment for weeds such as clover, chickweed, and ground ivy. Watering thoroughly and only when needed will thus discourage weed encroachment.

Applying fertilizer in the proper amounts and at the correct time is a must for obtaining a vigorous stand of grass and discouraging weed encroachment. Good soil drainage and minimizing soil compaction are also important in favoring your grass

Continues on page 56

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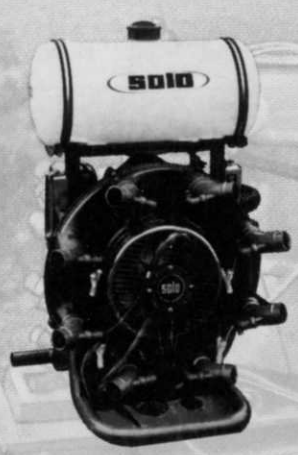

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SOD PRODUCER NEWS

Forklift innovation stops pallet theft

The owners of an Indiana turf farm have developed one practical method of reducing work site theft of sod pallets. The system allows a forklift to remove the pallet from the sod stack without damage to the sod.

Harold and Victor Keigley and Harold Helter of Red Hen Turf Farm devised the method with the help of equipment maintenance man Don Kilgore in 1978 and gave the idea to the American Sod Producers for further development. Four turf equipment companies have begun to work on production of prototypes.

Called an extruder system, the devise consists of a thick plastic plate attached to the pallet and hydraulic push bars on the forklift to slide the sod off the pallet.

The innovators said pallets last longer, the need to pick up pallets after the job is eliminated, and theft is virtually eliminated.

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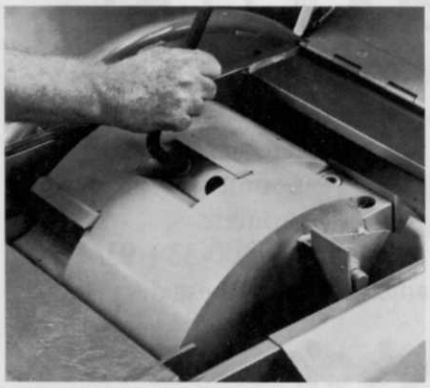

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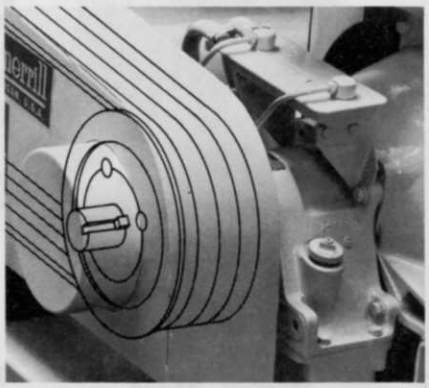

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Second Orlando Inn to house meeting goers

If you haven't already made your reservations to attend the American Sod Producers Association Winter Meeting in Walt Disney World's Contemporary Resort Hotel because you thought there were no rooms, there still is a way to have a hotel room when you get to Orlando. The Dutch Inn Resort on the edge of Disney World will take reservations until Feb. 1st. ASPA advises you call the Inn (305-828-4444) right away and guarantee a room by credit card or deposit.

Scheduled dates for the ASPA meeting are Feb. 24-26. For conference registration contact ASPA, Association Bldg., 9th and Minnesota, Hastings, NE 68901 (402-463-5691).

ASPA President John Hope recently indicated that the meeting and future association efforts will seek to differentiate northern and southern sod production. More attention to vegetative production methods is likely in 1980. For this reason sessions will be split in Orlando to help serve the southern grower better. Afternoons will be free to enable show goers to sample some of the vast recreation potential of Disney World and other Orlando attractions, such as Sea World.

Florida researchers seek ways to hasten vegetative turfgrasses

Philip Busey and B.J. Myers of the Florida Agricultural Experiment Station in Ft. Lauderdale, recently reported in the Agronomy Journal (Vo. 71, No. 5) that it may be possible to accelerate growth of vegetatively propagated turfgrasses and thereby improve the efficiency of commercial sod production.

The researchers have begun tests to counteract the slowing effect on grass growth caused by a natural tendency for stolons and rhizomes to pack together. The plants becoming self-inhibiting when densely spaced.

Improved growth rates were achieved by dividing the sod frequently. This was accomplished under greenhouse conditions by cutting two- to three-node stolon pieces from each clone and transplanting them in the same plot. Frequency of division and improvement of growth rate depended upon the type of turfgrass.

Other findings by Busey and Myers included improved growth rates in sand over sand/muck or sludge, and little improvement by temperature changes.

For more information contact the Busey or Myers at the University of Florida Agric. Res. Center, 3205 S.W. 70th Ave., Ft. Lauderdale, FL, 33314.

Brouwer rolls out 1,000th harvester

Gerry Brouwer, president of Brouwer Turf Equipment, Keswick, Ontario, Canada, must have felt very confident and proud of his product as the 1,000 sod harvester came off the line recently.

Sharing in the celebration was the buyer of the 1,000 unit, Greg Lurvey of Lurvey Sod Farms, Dausman, WI, and the seller, Rolley Kieffer of Milwaukee Ford Tractor.

The well-known harvester is now sold in 11 countries.

If that weren't enough, the government of Ontario presented the company its achievement award for increased exports, job creation, facilities expansion, and product research and development. Slightly more than 100 companies have received the award in the 17 years of its existence.

Celebrating Brouwer's 1,000 harvester are (l. to r.) Gerry Brouwer, the Lurveys, and Rolley Kieffer of Ford.

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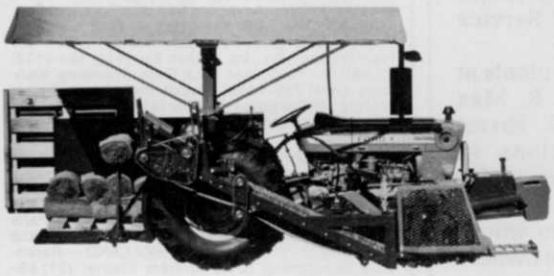

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News *from page 12*

Dottie Krantz and James Williams from the park district told participants at the Ohio Parks and Recreation Association annual conference, held in Cleveland Nov. 26-28, that in a six-month period 63 volunteers gave 5,000 hours of their time. This figured into a savings of $15,000-$30,000 after a training expense of $400-$500.

Park personnel asked volunteers to fill out two cards — one with basic information and the other with hobbies, interests, and prior volunteer programs. Through the special information from registrants, the park found people with a variety of useful talents. Volunteers were then placed in the best position for their skills. One person designed the park's brochure and others helped out in some extraordinary ways.

The park gave each volunteer a manual explaining about the park, its wildlife and vegetation, along with guidelines for work. All volunteers wore "V.I.P." (Volunteer-In-Park) badges on them at all times.

After 10 weeks of training, volunteers were given a certification of achievement. At the end of the full session, they had a graduation picnic. A questionnaire about the program asked if they would continue and most said "yes."

Not only is their time and effort profitable to the park district, said Dottie Krantz, but their public relations. "As they go out, they're selling the park to others with their enthusiasm."

Other sessions on the program dealt with minority recruitment, team leadership in management, publicity for the media, the Urban Park and Recreation Recovery Program, safety and security, computers as management aids, and maintenance and conditioning of athletic fields.

ENERGY

Forest fires destroy vast amounts of energy

Forest fires in the U.S. annually burn the energy equivalent of 447,000,000 barrels of oil—or more than 12 percent of the oil we import, says Norval Morey, president of Morbark Industries Inc.

Morey says that if we would thin our forests and use the wood for energy we would help solve our forest fire and avoid most of this loss. A forest virtually without dead wood to kindle extreme temperatures.

Our forests are in deplorable condition today, with a vast amount of dead, dying, diseased, overmature, and undersized trees as well as trees that are of species not in demand for such things as lumber, pulp, paper, and other conventional wood product uses, Morey says. The forest should be properly managed and used to power industries across the nation that now burn imported oil to make steam heat and electricity.

In countering arguments of studies showing a high degree of air pollution in areas where wood is burned in wood stoves, Morey points out that burning wood in industrial boiler systems represents one of the cleanest fuels available today.

Industrially burned wood, for example, has very low sulfur content, a tenth that of the lowest sulfur coal. There is very little particulate emission. The proportionately small amount of ash generated can be collected and sold as a fertilizer ingredient. Industrial wood-fired boilers easily control nitrous oxide emissions.

FORESTRY

Forest chief: we need wise management in 80's

Efficient management of small, privately-owned commercial forests and careful planning of government-owned wilderness areas are major concerns of the U.S. Forest Service in the 1980's, its chief says.

Speaking to faculty and students at Michigan State University, R. Max Peterson, chief of the U.S. Forest Service, discussed directions in natural resource development for the next decade.

He said the forest service would like to do more to provide the owners of small, private forestry operations with information on how to manage their forests for more and better uses of the wood they produce.

"Many people think of forests as the property of state and federal governments for the most part," he says. "Actually, more than 60 percent of all the commercial forestlands in this country are operated by small, private owners."

Continues on page 60

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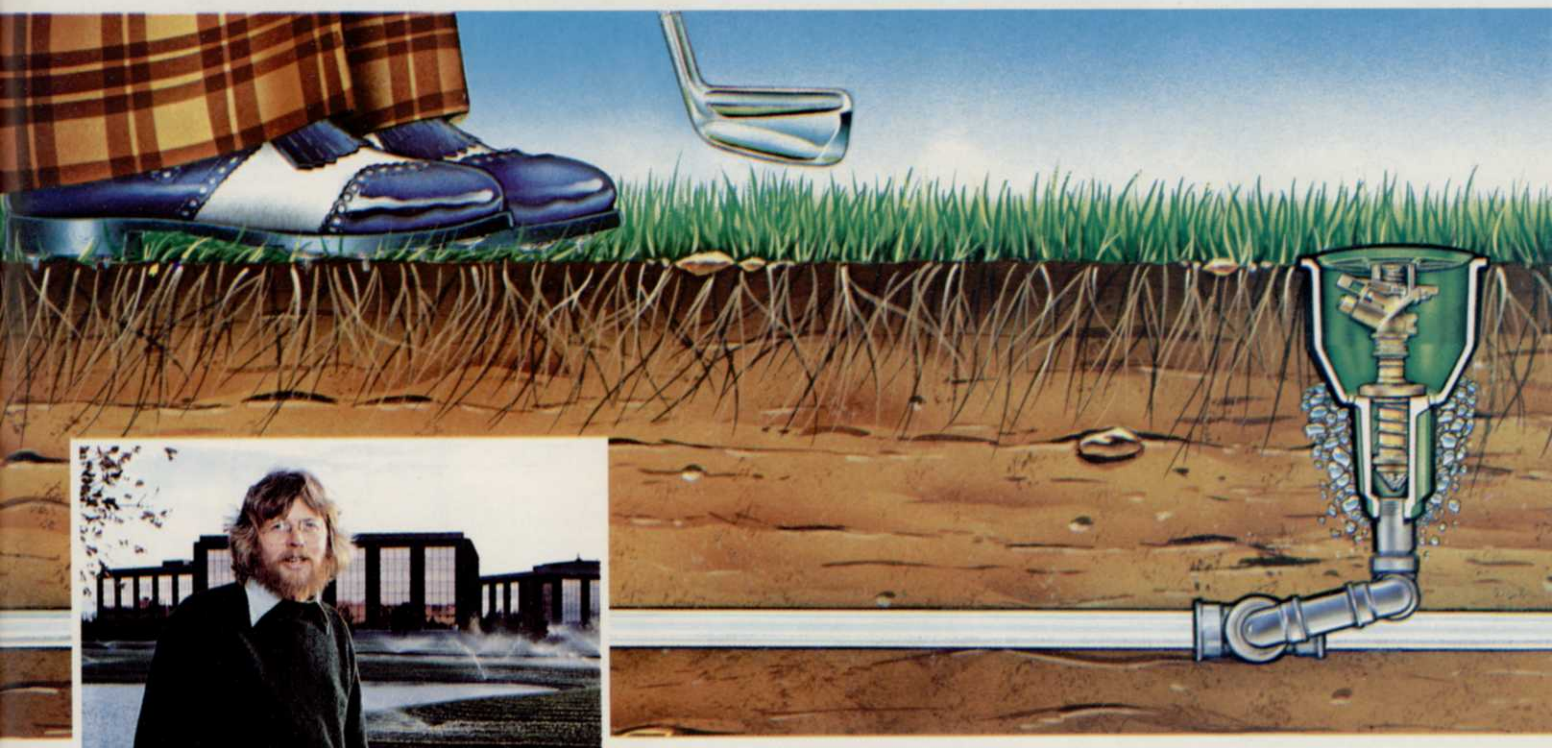

Greenwood Plaza Office Park
Englewood, Colorado

"We started with Weather-matic equipment 9 years ago with our first 3 properties and never had any reason to change. We'll soon have almost two million square feet of landscaping under irrigation. Weather-matic must be doing something right!"

Jake Frankhouser, Landscape Architect
Jake Frankhouser and Associates
Denver, Colorado

Weather-matic is doing something right! We are providing turf professionals all over the world with the right kind of equipment, specifically designed to water every type of grass, plant or shrub.

When you specify Weather-matic for your irrigation system requirements, you can depend on us for quality, cost effectiveness and service that insures years of satisfaction.

Tough, dependable, field-proven Weather-matic products are available through a worldwide network of local distributors and dealers.

For the name of the Weather-matic distributor nearest you, or to get more information, send the coupon below or call us in Dallas at (214) 278-6131.

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LAWN SPRINKLER SYSTEMS

BOX 18205 DALLAS, TEXAS 75218 (214) 278-6131

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Mail Coupon To: Weather-matic Division, Telsco Industries WTT
Box 18205 Dallas, Texas 75218

Please send the following:
- ☐ Information about Weather-matic products
- ☐ Weather-matic Distributor Directory
- ☐ Information about TURF IRRIGATION MANUAL
- ☐ Assistance for pending project

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TITLE _____

ADDRESS _____

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Lescosan, the name you remember for crabgrass control.
LESCO Sulfur-Coated Fertilizer,
the name to remember for greener turfs. *Ron Giffen, Vice President of National Sales*

I've told you about our Lescosan (Betasan*), the best selling pre-emergence crabgrass control on the market. You've proven its effectiveness. I'm here to tell you now that Lakeshore Equipment & Supply produces an equally effective line of sulfur-coated fertilizers.

LESCO Sulfur-Coated Urea and 100% Sulfur-Coated Fertilizers provide the perfect ingredients for denser, greener turf. The sulfur coating, applied to the fertilizer components, provides controlled release of nutrients for prompt and sustained feeding for safe, efficient and economical fertilization of turf in all areas of the country.

As supplier of the most effective full-season crabgrass control on the market — Lescosan (Betasan*) — and of the latest in controlled-release (sulfur-coated) fertilizers, manufactured by our subsidiary, Ag Industries Manufacturing, we have a special interest in the turf care market. Lakeshore carries a complete line of turfgrass supplies made and distributed with you in mind. The full family of fine LESCO Products mean quality at affordable prices.

Call Lakeshore today and ask about Lescosan, Sulfur-Coated Fertilizers and our other turfgrass supplies. Ask for Barb — she'll have one of our turf specialists give you the full story and work out a complete program tailored to meet your specific needs.

Ask about our Lescopex (MCPP) and LESCO 2,4-D.

*(Betasan—registered TM of the Stauffer Chemical Company.)

Get the most for your Lescosan dollar. Use the patented ChemLawn Gun.

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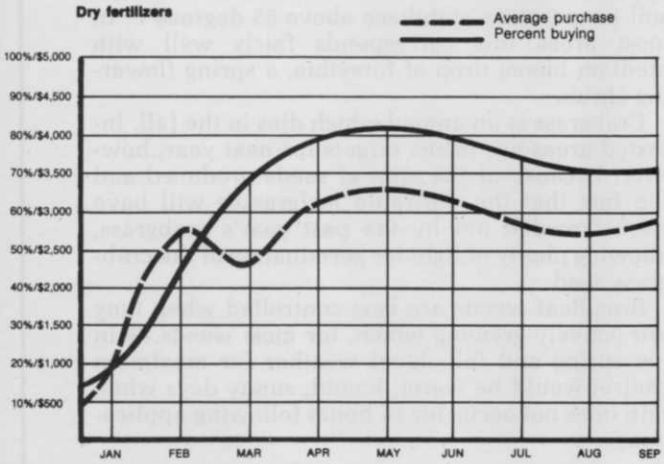
A Family of Fine Products: Lescosan 12.5G—Lescorene—Lesco 4—Lescobor—Lescopar—Lescopex—Lesco Non-Selective Herbicide—Lesco MSMA—Lesco Thiram 75W—Lescozyme—Lakeshore Chinch Bug & Sod Webworm Control.

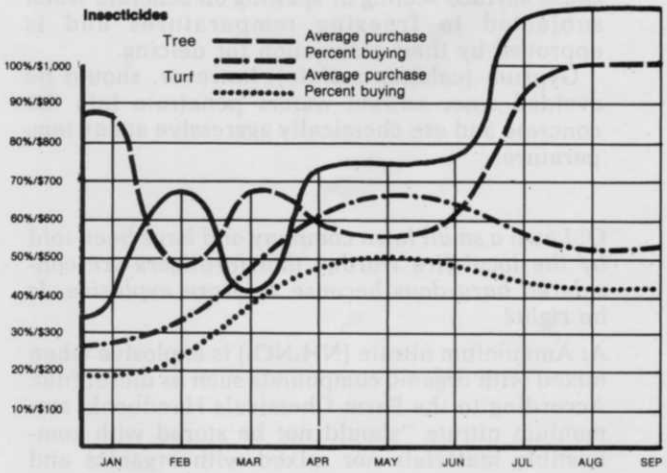
Circle **143** on free information card

February *from page 39*

The 10 to 20 h.p tractor pulled ahead of the 30 to 50 h.p. tractor in 1979. Of all the types of equipment surveyed, irrigation equipment was the most evenly purchased type of equipment throughout the year. In the first three quarters of 1979, Weeds Trees & Turf readers purchased nearly $60 million in pumps, pipe, controls, and heads.

Seed was one item that consistently showed very high percentage of purchase every month of the year. Seed buyers outnumbered sod buyers by two to one in winter and stayed ahead thorughout the busy season. Trees and ornamentals also exceeded sod. Nevertheless, sod was purchased by nearly two thirds of landscape contractors in the second and third quarters for more than $88 million in the first nine months of 1979.





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INTERCHANGEABLE SPRAY TIP TYPES AND CAPACITIES...
tapered edge, even and wide angle flat spray ... hollow and full cone ... disc type hollow and full cone ... and flow regulators. The most complete line for spraying herbicides, insecticides, fungicides, liquid fertilizers and foam solutions. All materials. *For complete information write for Catalog 36 ... and for foam spraying ask for Data Sheets 13602 and 13626.*

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Ross TreeGARD is a snap-on plastic tube that expands to fit any young tree. Snaps-off & on in seconds for bark inspection.

Protects trees from:
- **Sun scald**
- **Rabbits and other rodents**
- **Mower bruises**
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#1687 24" TreeGARD 400/case $ _____
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6-25 cases: _____ @ $115.00/case $ _____
26 plus: _____ @ $107.50/case $ _____
Total: $ _____

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

Circle **144** on free information card

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *I have recently been using urea to melt ice and snow on walkways. Is urea, or certain forms of it, harmful to cement? For grit, I also add pelleted gypsum. Would this damage the concrete?*

A: I contacted the Portland Cement Association in Skokie, IL, and was told that urea is not known to cause surface scaling or spalling on concrete when subjected to freezing temperatures and is approved by their association for deicing.

Gypsum (calcium sulfate), however, should be avoided since sulfate waters penetrate into the concrete and are chemically aggressive at any temperature.

Q: *I own a small lawn company and have been told by the local fire warden that fertilizers are considered hazardous because they are explosive. Is he right?*

A: Ammonium nitrate (NH_4NO_3) is explosive when mixed with organic compounds such as diesel fuel. According to the Farm Chemicals Handbook, ammonium nitrate "should not be stored with combustible materials nor mixed with organics and superphosphate unless the free acid has been neutralized first." However, this certainly does not apply to all fertilizers. Many, in fact, can be used as fire retardants.

Ask your fertilizer distributor for a Material Safety Data Sheet for each of the fertilizers in your program.

Q: *Why do road salts cause plant injury? Aren't fertilizers salts?*

A: The injury is primarily one of excess concentration. All salts, fertilizers included, will interfere with water absorption when salt concentration in the soil solution is greater than the salt concentration within the root cells. The resultant injury is known as "burn" or "physiological drought." In addition, sodium (a component of the common salt, sodium chloride NaCl) is toxic to plants in relatively low concentrations and breaks down the open structure of soils contributing to compaction.

Q: *What fertilizers do you recommend for pines, spruce, hemlock, and other evergreens in the Pennsylvania area?*

A: In general, we have obtained good results with the same 3:1:1 ratio recommended for hardwoods at rates varying from 75 to 200 lbs. nitrogen per acre. However, specific nutrient deficiencies do occur in certain soil types and locations, and identical treatments with the same plant species in different locations have not always given the same response. Have your soil analyzed at your state soil testing lab and follow recommendations.

Q; *When is the best time of the season to apply pre-emergent crabgrass and broadleaf control? What about last year's crabgrass on the lawn for the upcoming spring?*

A: Pre-emergent crabgrass herbicides control the germinating seedling only and, therefore, must be applied before germination which occurs after the soil temperature stabilizes above 55 degrees F. In most areas this corresponds fairly well with medium bloom drop of forsythia, a spring flowering shrub.

Crabgrass is an annual which dies in the fall. Infested areas are prime targets for next year, however, because of the crop of seeds produced and the fact that the desirable turfgrasses will have been crowded out by the past year's crabgrass, allowing plenty of light for germination of the crabgrass seed.

Broadleaf weeds are best controlled when they are actively growing which, for most weeds, is in the spring and fall. Ideal weather for maximum control would be warm, humid, sunny days when rain does not occur for 24 hours following applications.

Q: *Can dormant oil be applied in the fall? We have a problem in applying at the proper time in the spring because of bad weather.*

A: This subject was discussed at the recent meeting of the Entomological Society of America where the general feeling was that satisfactory control could be obtained by a fall application of dormant oil spray.

During the interval from dormant to delayed dormant stage of bud development, the weight of some scales increases between four and eight times, and the level of control is reduced.

On the other hand, mites become more susceptible to the dormant oil spray as bud break approaches and the eggs are about to hatch.

More research on this subject is planned for the near future and, hopefully, the overall effectiveness of fall applications will be answered.

Q: *Are there any good herbicides other than 2,4-D or those that contain 2,4-D for broadleaf weed control in lawns?*

A: We have not found any that are as effective on a wide spectrum of weeds.

A free problem solving service to Weeds Trees & Turf subscribers. Send your question to Dr. Funk by using the postpaid editor card in this issue. Think ahead where possible since it takes about two months to receive, answer and publish.

hydrostatic drive which protects the engine from shock loads at the rotor. A remote control panel mounts on the prime mover and provides the operator with convenient controls for starting, speed selection, rotor disengaging, and stopping.

Other features include adjustable skids, tree pushers, and a 60-inch wide rotor assembly. The skids permit cutting from ground level to 5 inches high and the tree pushers protect the operator and direct trees into the cutting path. The rotor assembly consists of 20 19-inch-diameter discs and 38 heat-treated, alloy steel cutters which are double-edged, freeswinging, and easily reversed or replaced.

The machine measures 7 inches long by 78 inches wide by 53 inches high. It attaches to front-end loaders and other equipment which can handle 6,000 pounds. A GM 4-53N, 4-cylinder, 117-horsepower diesel engine drives it. (Circle **214** on free information card).

Other manufacturers of right-of-way brush cutters are Bombardier Ltd. (**215**), FMC, Agricultural Machinery Div. (**216**), National Hydro-Ax, Inc. (**217**), NFI, Inc. (**218**), Pettibone Corp., Ala. Div. (**219**), Rhino by Athens & Servis, Austin Prod. (**220**), and Washington Industrial Resources (**221**).

Miscellaneous

To top trees, cut fence rows, and reach limbs that are too distant for most equipment, a ZZZ-CUT works well. It cuts and removes limbs with a boom-mounted cutter head that is hydraulically controlled from inside the cab.

The cab of this trimmer, made by Products for Energy Inc., is completely enclosed so an operator can work in rain, cold, or heat. It drives over ditches, up hills, and through mud to get to any site. No-spin axles add traction to the four-wheel drive.

The ZZZ-CUT can travel 40 to 45 mph on the open road and does not have to be hauled to a different work location. (Circle **222** on free information card).

Excel Industries, Inc. makes a Hustler 402 mower that cuts 72 inches out front and works on sloping terrain while the operator remains comfortably upright. The self-leveling cab maintains level operator station and engine platform even on slopes to 27 degrees. Weight distribution stays balanced on high and low drive wheels.

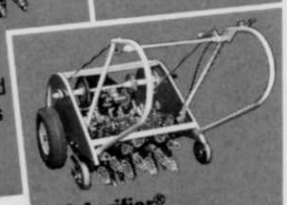
The four-wheel drive mower crawls in and out of ditches, climbs banks, and turns on slopes. Dual hydrostats operate the drive wheels independently and twin hand levers steer at a touch to control both direction and speed. With its low center of gravity, the mower climbs and turns a full circle while it continues to cut grass and weeds.

Continues on page 56

Hahn
THE TURF PROFESSIONALS
A complete line of Aerifiers for fairways, athletic fields, industrial and institutional lawns . . . at prices you will like!

Also available: A precision Verti-Cut Thatcher specially designed for golf green maintenance

TM-140
6 ft. swath. Three-point hitch mount and weight rack. Also available with wheels and hydraulic lift.
AB-1 Aeri-Boy: 4 ft. swath.



JR-3 Aerifier®
2 ft. swath. Self-propelled, fast and maneuverable.

Optional Spoons and Blades for double utility.

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ACECAP™
SYSTEMIC INSECTICIDE IMPLANTS

ACECAPS are the modern way to control insect pests "in" ornamental trees. No need for expensive spray equipment; no danger of spray drift or runoff; and eliminates measuring and mixing of chemicals. Simply drill the tiny implant sites, insert the ACECAPS, and forget them. The insecticide will be translocated throughout the tree, killing targeted insects and providing continued protection. There is no need to return and remove applicators — the ACECAP Implants are left inside the tree where callous tissue will cover them in a short time.

ACECAPS contain **ORTHENE®** — a new generation insecticide which combines highly effective, broad spectrum insect control with a reduced hazard to humans, wildlife and the environment.

ACECAPS Systemic Insecticide Implants offer the ultimate in an environmentally acceptable insect control program. Any pesticide can be harmful if misused; **READ AND CAREFULLY FOLLOW LABEL DIRECTIONS.**

TREE SYSTEMS®
MEDICAP
SYSTEMIC TREE CARE

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Better lawn care products to do the job easier & faster

Model 210356 illustrated

POWERMOW

New from F. D. Kees, this powerful 21" mower with heavy 12 gauge steel deck and frame is built to stand up under rough use and keep on working year after year.

- Choice of 4 cycle, 3.5 or 5 hp Briggs & Stratton I.C. commercial engine.
- Heavy gauge steel handle folds down without tools for easy transport and storage. Rigid "T" type handle also available.
- Special one-piece, suction-lift blade with tempered cutting edges. Adjustable cutting heights 1 to 3.5 inches.
- Heavy-duty steel wheels with grease fitting and sealed ball bearings. 8 x 1.75 tires.
- Special crankshaft protector.
- Extra large 1½ bushel nylon bag grass catcher available.
- Dual filter air cleaner.

Model 100528

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(THATCHER)

Fold-over handle

■ Rakes out thatch ■ Cleans 20" swath ■ Powerful 5 hp engine with dual filter air cleaner ■ 28 hardened steel plate, self-cleaning fingers ■ Improved heavy-duty wheels ■ Raking assemblies interchangeable with aerator assembly ■ 2" single-action raking height adjustment ■ Semi self-propelled

Since 1874

Write P.O. Box 938

F. D. KEES MFG. CO.
Beatrice, Nebraska 68310

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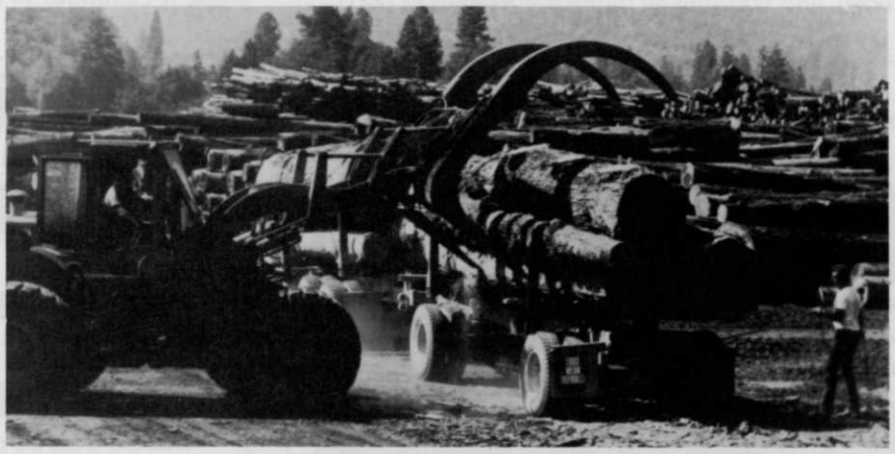
Workhorses *from page 55*

A choice of mowing decks includes the heavy-duty 72-inch rotary and a 60-inch flail mower, both with rear discharge that is effective for places debris is concealed by heavy grass and weeds. (Circle **223** on free information card).

After all the cutting is done, a log fork from Tube-Lok Products may be used to carry out loads. Every log fork is box-welded for increased carrying strength to handle large single or multiple-log loads in one pass. The manufacturer claims that carrying capacity meets or exceeds the actual lifting capacity of all lift vehicles.

Log forks are constructed of high-strength alloy steel, with extra large heat-treated pins and hardened steel bushings. Wear bars are hard faced to extend tine life. The spacing of fork cross-members gives the operator good visibility for productivity and safety. (Circle **224** on free information card).

Hustler highway rotary mower.



Log fork from Tube-Lok Products.

Alternatives *from page 47*

over weeds. If a few weeds do appear, removal by hand can help keep the problem from becoming serious by preventing spread of weed seed.

These basic principles of good management to reduce weed encroachment are not new, but need to be re-emphasized. Too much dependence has been placed on using herbicides to cover up what may be the result of bad management. When a chemical such as silvex is lost, we can be faced with a weed problem which may only be solved by complete renovation of the area. Also, a weed problem which is solved temporarily by herbicides is certain to return if bad management continues. Good management will certainly not eliminate the need for herbicide applications, but it will greatly reduce the seriousness of weed problems that could eventually occur.

Reprinted from The Agronomist, University of Maryland, College Park

A WORD TO THOSE WHO THINK IT TAKES A FORTUNE TO MAKE BIG MONEY IN LAWNCARE.

ANNOUNCING THE LOW-INVESTMENT, NO-FEE, NO-ROYALTY, NO-ADD-ON PROFIT PROGRAM FROM AGRO-CHEM.

For as little as $5000, you can become part of the fastest growing field in the great outdoors. As an independent dealer of Agro-Chem, a leader in lawncare products and training.

Agro-Chem will supply you with everything you'll need to grow along with the incredibly profitable lawn-spraying industry that has seen sales increase more than 20% in the past year alone.

As manufacturers, we ship directly to you from our modern plant in Franklin Park, Illinois.

There are no profit-picking middlemen involved. (Our profit comes from the products you buy.)

And best of all, you remain your own boss. Free to grow with the rising demand in your own area.

WE HELP YOU ALL THE WAY.

We'll teach you the very latest in organic, scientific lawncare. And we'll supply you with super-effective sales tools.

Newspaper ads. Radio commercials. Brochures, door-sellers, publicity and advertising.

You supply the desire to make big money in this growing field.

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Agro-Chem lawn nutrients are totally organic. Natural. And specially formulated by us according to soil tests in your area.

There are no harsh chemicals that can lead to weakened, disease-ridden lawns. Instead Agro-Chem nutrients create a natural, deep-root growth that assures green lawns and turns undesirable thatch into humus. And all Agro-Chem products have been proven effective, and profitable, after thousands of residential, commercial and institutional applications.

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The return investment is substantial, from the start.

For instance, an initial product order costing you $5000 can bring you a gross profit of about $10,000. Even if you begin with a small truck and only a 300-gallon product tank.

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Call us collect today, or fill out and return the attached coupon to receive our no-obligation booklet describing your incredible profit potential as an Agro-Chem dealer. But act now, and be ready for the big profit season ahead.

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ENKAMAT WILL HELP KEEP THE ORANGE BOWL GREEN.

And the stadiums of Purdue and New Mexico State, the playing fields of Lovett, T.C. Roberson High and Coral Gables Park, Fore Lakes Golf Club, Wellington's landing strip and more.

Dr. William H. Daniel of Purdue University, turf grass specialist and developer of the PAT (Prescription Athletic Turf) system, said after extensive greenhouse testing and outdoor field observation of Enkamat: "I think Enkamat is resilient and durable, and will substantially increase sod stability."

Enkamat, a 3-dimensional webbing made of nylon monofilament fused at the intersections, is being installed on major playing fields and parks across the country. As such, it will help scarred turfgrass heal itself, reduce compaction and wear and promote a strong root system. Enkamat should also provide a resilient but firm footing so players' injuries may be greatly reduced.

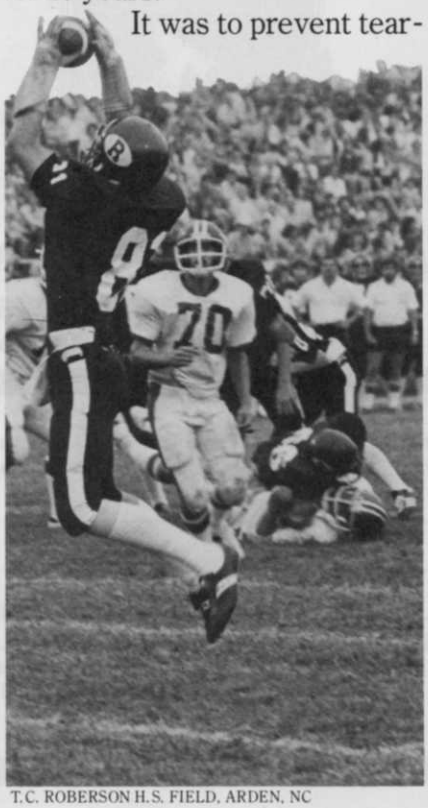
Enkamat will also hold turf together so damage from tearing and divots is minimized. And because Enkamat is an *open* webbing, it will maintain grass on high-traffic areas without the constant need for aeration. It has been tested and used successfully on playing fields in Europe for 10 years.

It was to prevent tearing and compaction on heavily trafficked areas that Dale Sandin, Grounds and Turf Manager of the Orange Bowl, had Enkamat webbing installed. Now, 6 months later, he's pleased with how the turf is holding up.

Other success stories keep coming in. Purdue, of course,

FORE LAKES GOLF CLUB, SALT LAKE CITY, UT

AGGIE STADIUM, N.M. STATE U., LAS CRUCES, NM



T.C. ROBERSON H.S. FIELD, ARDEN, NC

THE ORANGE BOWL, MIAMI, FL.

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Circle **118** on free information card

had over 22,000 square feet of Enkamat installed along with its PAT system and they're "tickled pink" by the results. T.C. Roberson High and the Lovett School, Atlanta, GA, installed Enkamat because it increases playing time on their fields so they can schedule more events. New Mexico State University installed 22,500 square feet of Enkamat to restore the field and reduce their maintenance hours at Aggie Stadium.

Both the soccer field and playground of Coral Gables Park had Enkamat installed and they report greener-looking grass. The Mel Reese Golf Club, Miami, FL, installed Enkamat on its tees, Fore Lakes Golf Club put 10,000 square feet of it on their driving range, and Biltmore Forest Country Club, Asheville, NC, installed Enkamat on the golf cart path. The Wellington landing strip in West Palm Beach, FL, and the David B. Oliver High School, Pittsburgh, PA, are both in the process of installing Enkamat. As time passes, there will be a lot more success stories.

Life, and your turf, will have fewer problems if you install Enkamat. For more information, contact Turfibre Products, 1934 N.E. 151 Street, North Miami, Florida 33162, (305) 947-4649, Tom Mascaro, Manager.

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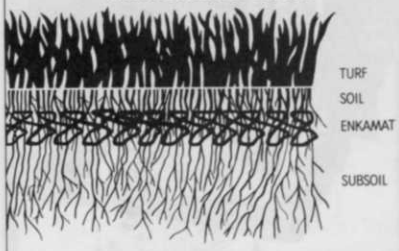
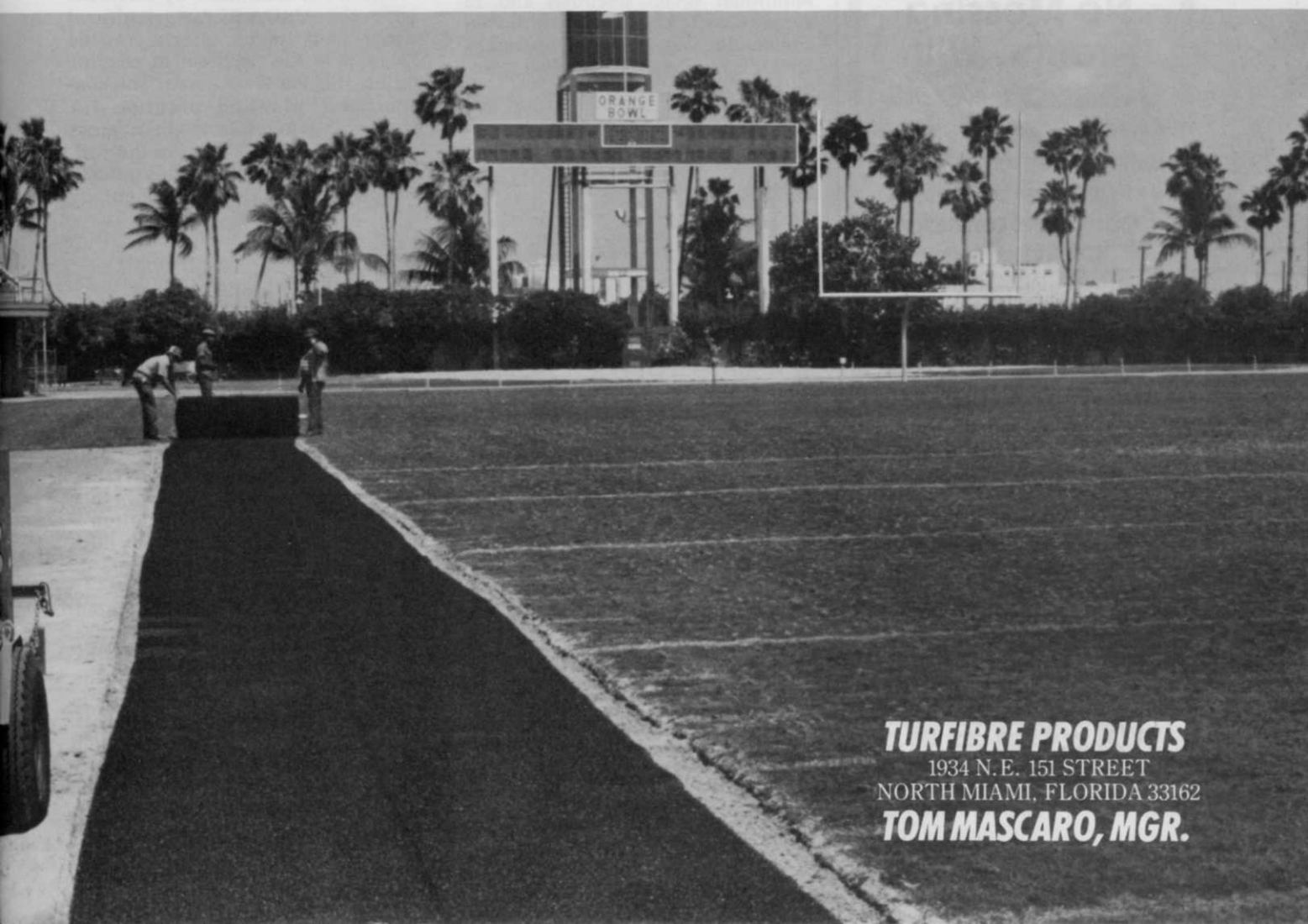
ENKAMAT® BY ENKA

The innovative webbing used in a sub-soil system that increases grass growth and decreases maintenance costs.





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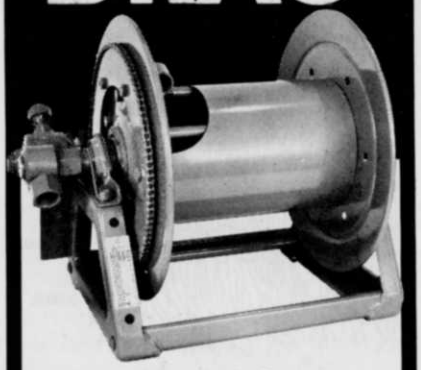
HOSE WITHOUT A REEL IS A DRAG



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Eliminate hose mess with Hannay Reels!

- Pull out smooth & easy. Wind up straight & fast.
- Store hose neatly, ready to go when you are.
- Less wear and tear on you and the hose.
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Buy Hannay Reels and Wind Up With The Best

HANNAY REELS

Clifford B. Hannay & Son, Inc., Westerlo, New York 12193

Circle **108** on free information card

News *from page 50*

SOIL EROSION

Builder receives laboratory contract

Geupel DeMars, Inc., Indianapolis, IN, has been awarded a contract for construction of the U.S. Department of Agriculture's National Soil Erosion Laboratory. The Laboratory will be on land made available to the U.S. government by Purdue University in West Lafayette, IN.

The $3,930,000 contract, which provides for construction of a one-story building and basement, was awarded by the department's Science and Education Administration (SEA). Plans call for the addition of a second floor as funds and authorization become available.

With about 21,000 square feet of usable floor space, the one-story laboratory is designed for multidisciplinary studies by about eight SEA Agricultural Research scientists and 10 support staff. The second floor could provide enough space for an additional seven scientists and 12 support staff. There also will be accomodations for cooperative studies with Purdue researchers and graduate students.

PESTS

U.S., Canada seek spruce budworm cure

The Canada/United States Spruce Budworm Program (East) is accepting proposals for research contributing to the protection of eastern spruce-fir forests from damage by the eastern spruce budworm *(Choristoneura fumiferana)*. Limited funds for grants have been provided for 1980, 1981, and 1982.

CANUSA is an international research and development program sponsored by the USDA Forest Service and the Canadian Forestry Service to promote the development of integrated management techniques for minimizing the impact of spruce budworm infestations. For more information, contact: Melvin E. McKnight, Program Leader, Spruce Budworm Research and Development Program, USDA Forest Service, Rosslyn Plaza E, 1627 No. Kent Street, Rosslyn, VA 22209 or Daniel M. Schmitt, Program Manager (East), Canada/United States Spruce Budworms Program, USDA Forest Service, 370 Reed Road, Broomall, PA 19008.

SEEDS

Punch planting helps establish seeds

In experiments to establish grass from seed under drying conditions in the Southern Great Plains, punch planting produced a satisfactory number of seedlings when there were very few from conventional planting.

Plant punching, a method of placing seeds in small diameter holes punched in the soil and left open to the atmosphere, made no difference where water was adequate. Optimum depth of punch planting was related to seed size and seedling vigor. Small diameter holes (¼ inch) produced best plant emergence, because the bottom of small holes dried slower than the bottom of large holes.

The tests, conducted by scientists with the USDA-SEA-Agricultural Experiment Station, offer a possible solution to the problem of seeding failures in the Plains area. The conventional planting practice for perennial grasses is to place grass seed about ½-inch deep in the soil, but that soil layer often dries quickly and prevents plant establishment.

TURF

Turfgrass group honors Cornell prof

The New York State Turfgrass Association has honored professor emeritus John F. Cornman of the N.Y. State College of Agriculture and Life Sciences at Cornell University.

Cornman, a specialist in turfgrass management and an authority in this field, received the Association's Citation of Merit given annually during its turfgrass conference.

In another event at the college, A. Martin Petrovic has been appointed assistant professor of turfgrass science in the department of floriculture and ornamental horticulture.

Petrovic recently completed his doctoral degree in the department of crops and soil sciences at Michigan State University. His research is in the areas of turfgrass management and soil physics.

In Europe, engineering thermoplastics can be expected to continue to rake market share away from metals, despite oil price increases that would seem to hurt hydrocarbon-based plastics, according to a report by Frost & Sullivan, Inc.

The report says, "Steel, aluminum, zinc. copper, and most other metals are more energy expensive on a cost per unit volume basis than are plastics." The 286-page report, entitled "European Market for Engineering Thermoplastics," says, "The competition between engineering thermoplastics and zinc and aluminum diecastings has been won in almost all applications by plastics."

And it adds, "Pending legislation (to lessen automobile weight and improve safety) will also stimulate the use of more thermoplastics in automobiles. in particular." What this leads up to is that European consumption of 13 selected thermoplastics will increase from 0.5 million tons in 1976 to 1.25 million tons in 1981.

HERBICIDES

Devrinol gets label for use on ornamentals

Devrinol, a surface-applied herbicide, has been federal registered for weed control in ornamentals, field-grown nursery stock, liner stock, ground covers, and dichondra. The Stauffer Chemical Co. makes it.

Devrinol is labeled to control eight annual grasses including barnyardgrass, bristly foxtail, and large crabgrass, as well as 12 annual broadleaf weeds, including common purslane, lambsquarter, and redroot pigweed. It can be applied as a broadcast treatment over young nursery stock or as a directed spray to larger stock either as a band or broadcast application. It is recommended on several different container potting soil mixtures.

ARBORISTS

Arborists to meet for week in Florida

The National Arborist Association will hold its annual meeting at the Orlando Hyatt House in Kissemmee, FL, from February 17-21.

The major focus of the meeting will be on electronic data processing for tree service firms, labor relations, integrated pest management, and safety. As usual, there will be a general session, as well as a concurrent alternate session. The latter is particularly geared for additional members of the management team.

The four days previous to this program, February 13-16, the American Society of Consulting Arborists will convene at the same place.

Topics for the ASCA meeting include working with engineers, assistance to park personnel, trees on the golf course, value of trees from the shade they cast, the skill of arboriculture, casualty loss, appraisals for large trees, and tree injections.

HORTICULTURE

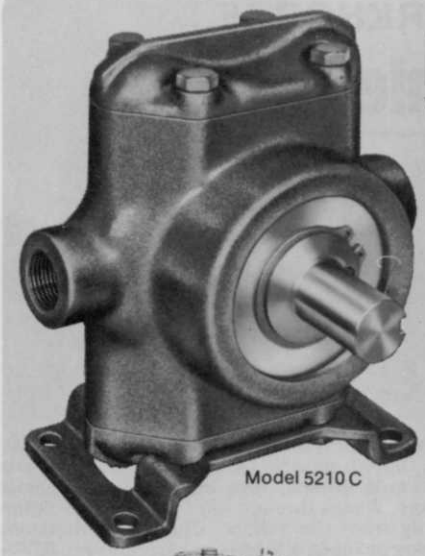
Volunteer program will help gardeners

A group of volunteer gardeners will be spending several winter weekends in classrooms studying the latest developments in watering, seeds, pest management and control, fertilizers, planting, and other gardening practices. Their goal: to become certified "Master Gardeners" and help community and family gardeners next spring.

This pilot program through the University of California's Cooperative Extension Service is operating in Riverside and Sacramento counties and plans for expansion to other areas are being developed. The program will identify and select local residents with experience in gardening and put them through a training program with the help of Cooperative Extension specialists and advisors.

These citizen volunteers will receive certification as "Master Gardeners" when they complete their training, and will become a part of Cooperative Extension's effort to help backyard, family, and community gardeners.

Master Gardeners have been used in 20 other states to be advisors at gardening clinics set up in libraries, shopping centers, or fairs. They also have become coordinators and teachers at community gardens; managed local Cooperative Extension public service telephone systems; and have written horticulture service announcements and booklets distributed through Cooperative Extension offices.



For both Volume and Pressure

Use Hypro series 5200 Big Twin piston pumps.

Here's a rugged two-cylinder piston pump that will deliver up to 10 gpm at 400 psi (600 rpm) for tree spraying, area spraying, fogging, or termite pretreating.

Handles many kinds of weed and pest control chemicals including wettable powder suspensions.

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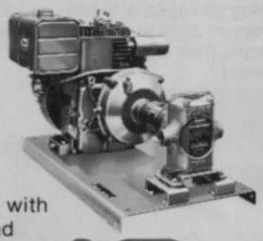

Also available with gas engine and mounting base.

FEATURES:
Leather or impregnated fabric piston cups.
Heavy duty ball bearings.
Suction & discharge ports tapped ¾" NPT.

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A DIVISION OF LEAR SIEGLER, INC.
347 Fifth Avenue NW, St. Paul, Minnesota 55112

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Letters *from page 6*

istence of these various associations, I have to admit that our AAN activities were primarily aimed at the needs of the wholesale nursery grower. Now it is my privilege as Executive Vice President to meet at least twice each year for many hours with those who govern these associations. In addition, at least one of our staff members who is responsible for administration of the association involved also attends these meetings which are really brainstorming sessions designed to develop the needs and ways to fill them of each segment represented. Every staff member meets with the AAN Board of Directors because that association in the final analysis represents all of the segments which operate separately in the so-called "family" of associations administered by our staff. In this way the "parent" is continually aware of the problems and needs of other members of the "family" and, as in any family, when a special crisis develops with one member, each of the others draws together using the assets of all to answer the need.

Over the years very fine organizations have been developed, representing other branches of this great industry. You mentioned the National Arborist Association, the Professional Grounds Management Society and even the brand new Professional Lawn Care Association of America in your Viewpoint article. These and others are doing a wonderful job of representing the needs of each segment of this environmental industry. It is our privilege through the Landscape Industry Advisory Committee to work closely with most of them, and we highly value the experience. Certainly we have learned that the American Association of Nurserymen does not have all of the answers nor is it capable of relating to all of the problems of this rapidly becoming vast industry. We have learned that, in addition to serving those organizations that are our direct responsibility, we can sometimes help a great deal with areas of concern to others. We stand ready to do that and proud to be able.

We appreciate your suggestion that members of LIAC cooperate together in every way possible, and I am sure, speaking for all of us, we intend to do just that. Based on the obvious will of this industry, each of the managers of the various groups involved, I think, carries a mandate to do everything possible for the segment of this industry he represents, protecting its separateness, but dedicated to accomplishing our overall goals with the least possible investment of association dollars required from our members.

There is very great strength in our separateness, and there is very great sense in our togetherness. I think, along with the industry we represent, the management of each association is learning that lesson well.

Robert F. Lederer
Executive Vice President
American Association of Nurserymen

YEAR 'ROUND WORKHORSE...

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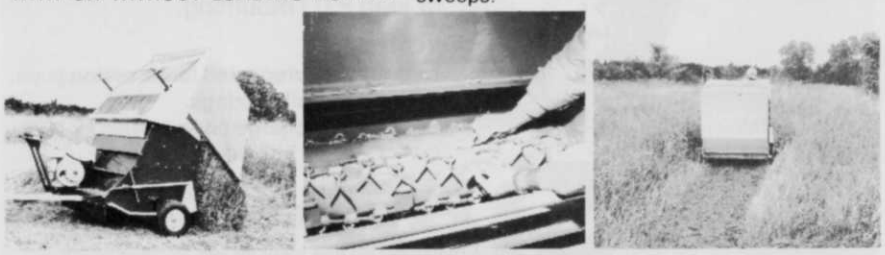
THE PICK-UP MOWER

Mow smoothly and pick up clippings in one pass! The rugged, versatile Lawn Genie thatches lawns, verti-cuts greens, tees and fairways, sweeps leaves, wades through high weeds and empties easily from the tractor. Change to thatching knives or replace blades in seconds with M-C's patented spring loaded hangers! It's the three season pick-up mower that cleans, mows and sweeps.

36", 48", 60" and 72" CUTTING WIDTHS—WITH OR WITHOUT LOADING HOPPER



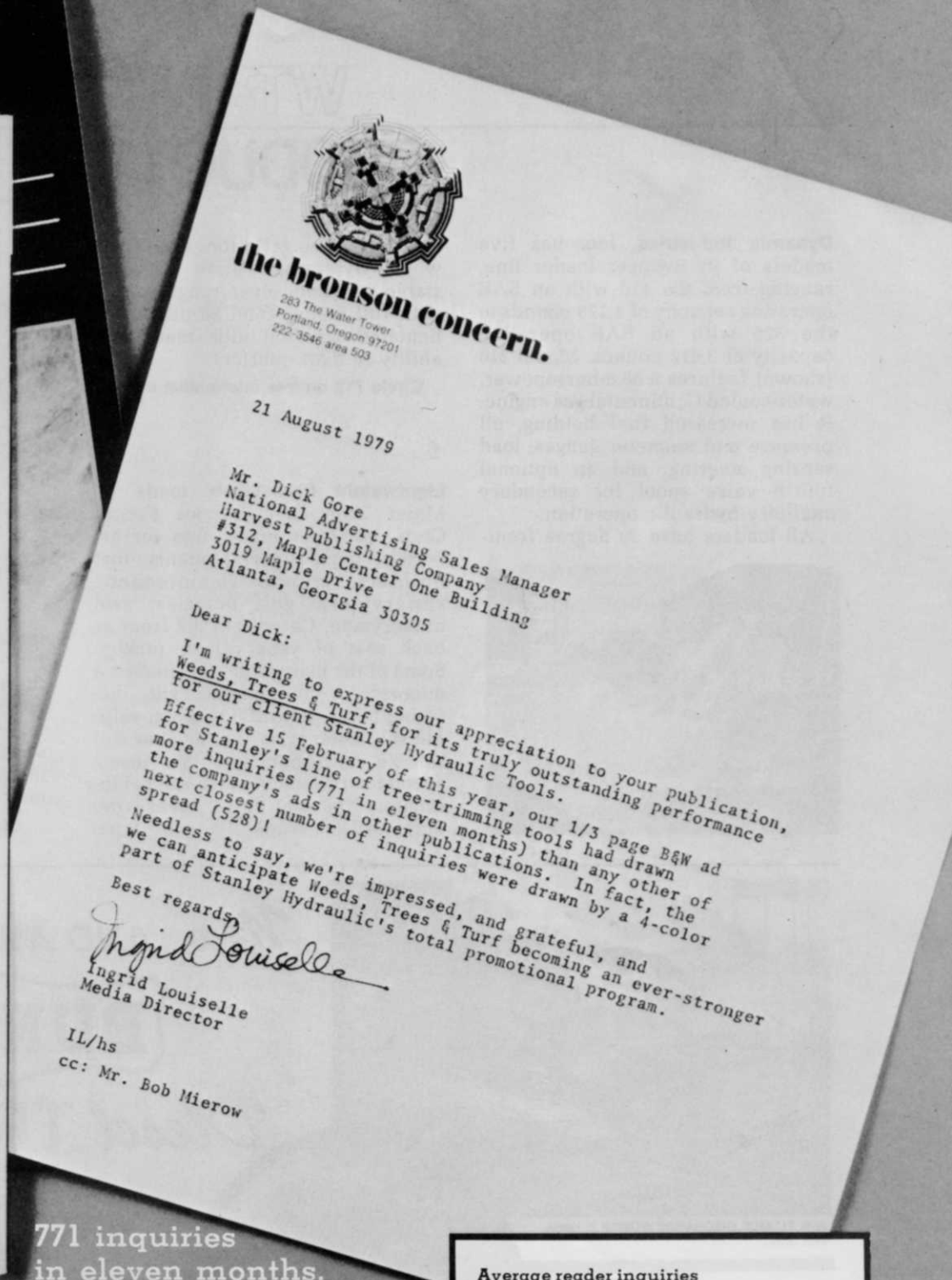
Mathews Company
BOX 70, CRYSTAL LAKE, IL 60014, PHONE: 815-459-2210
Circle **128** on free information card

Oak spit spot causes

In the November issue Dr. Funk was asked a question about the cause of oak spit spot and he asked for suggestions from readers as to the cause of this disease.

I have observed this problem in newly transplanted scarlet oaks on the Purdue University campus in West Lafayette, IN. During the summer following the late fall planting of these 2-3 in. caliper trees, wet spots (sometimes foamy) began to appear at random places on the trunks. Almost always there was a small fissure or crack in the bark at the top, center of the wet spot. Using a sharp knife, I cut a small (1 in.) square of bark out of the trunk at the top of the wet area and almost always found a small white flat headed borer. After removing the square of bark and the borer, I covered the wound with a good wound dressing and to my knowledge the trees are alive and healthy today (7 years later).

James Ross, Technical Foreman
City of Reno Park Div.
Reno, Nevada



the bronson concern.

283 The Water Tower
Portland, Oregon 97201
222-3546 area 503

21 August 1979

Mr. Dick Gore
National Advertising Sales Manager
Harvest Publishing Company
#312, Maple Center One Building
3019 Maple Drive
Atlanta, Georgia 30305

Dear Dick:

I'm writing to express our appreciation to your publication, Weeds, Trees & Turf, for its truly outstanding performance for our client Stanley Hydraulic Tools.

Effective 15 February of this year, our 1/3 page B&W ad for Stanley's line of tree-trimming tools had drawn more inquiries (771 in eleven months) than any other the company's ads in other publications. In fact, the next closest number of inquiries were drawn by a 4-color spread (528)!

Needless to say, we're impressed, and grateful, and we can anticipate Weeds, Trees & Turf becoming an ever-stronger part of Stanley Hydraulic's total promotional program.

Best regards,

Ingrid Louiselle

Ingrid Louiselle
Media Director

IL/hs
cc: Mr. Bob Mierow

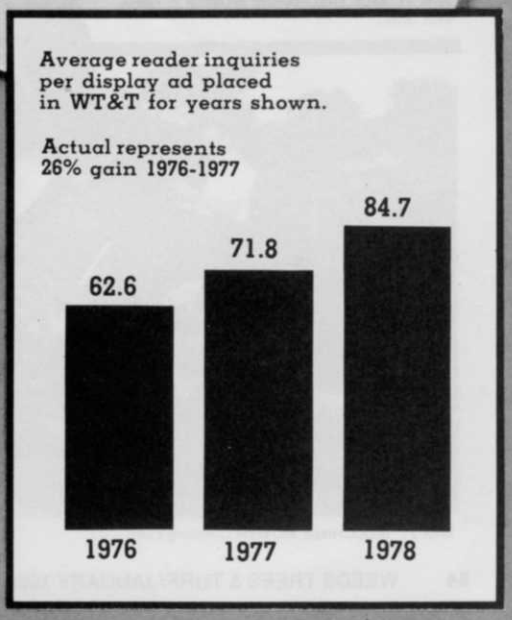
771 inquiries
in eleven months.

This Stanley one-third page in Weeds Trees & Turf pulled "more inquiries than any other publication . . . Even more than a four-color spread elsewhere"

—Ingrid Louiselle, the bronson concern

Buyers who track advertising performance know Weeds Trees & Turf magazine is highly productive . . . and we think productivity is a mighty important testimonial for media decisions.

Come grow with us. WEEDS TREES & TURF



PRODUCTS

Dynamic Industries, Inc. has five models of its Swinger loader line, ranging from the 110 with an SAE operating capacity of 1,175 pounds to the 320 with an SAE operating capacity of 3,012 pounds. Model 210 (shown) features a 56.8-horsepower, water-cooled Continental gas engine. It has increased fuel holding, oil pressure and ammeter gauges, load sensing steering, and an optional fourth valve spool for secondary auxiliary hydraulic operation.

All loaders have 20 degree front-rear frame oscillation and four-wheel hydrostatic drive for safe, stable operation over rough terrain with full loads. Total 80 degree articulated steering aids maneuverability in tight quarters.

Circle 712 on free information card

Lightweight Port-A-Lab, made by Maier Tree Care Service Center Corp., provides many uses for arborists, park superintendents, turf builders, grounds maintenance supervisors, golf courses, and nurserymen. Carry it in the front or back seat of your car or pickup. Some of the many items it contains: a microscope, microscope light, dissecting block, magnifying glass, soluble salt meter with test jar, four soil sample collection jars, six insect specimen collection vials, soil pH indicator, 100-foot lawn measuring tape, artisan trunk diameter tape, inspection binoculars, sub-soil moisture tester and tester probe, soil thermometer, pruning shears, dissecting knives and probes, reference book, soil sample extractor, styrofoam block for probing instruments, drawer for extras, and a master padlock.

Circle 707 on free information card

With 71" SIDE DISCHARGE MOWER in Heavy, Wet Grass.

30 H.P. DEUTZ DIESEL

With 71" MULCHING MOWER Climbing Curb.

New... AND AVAILABLE NOW!

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WITH 61"and 71"
FRONT MOUNTED
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Write or Call

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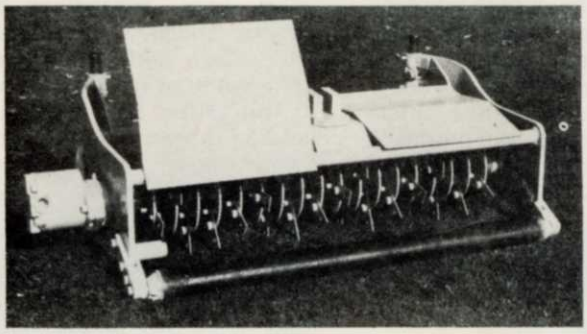
P.O. Box 33247
Louisville, Kentucky 40232 U.S.A.

Phone: 502/459-3810 Telex 204-340

 Circle **147** on free information card

Roseman Mower Corp.'s mowing attachment for verticutting fairways and other thatch areas is interchangeable with both the tractor-mounted and pull type Hydra-Gang mower. It is 30 inches wide and can be positioned with the Hydra-Gang reels in



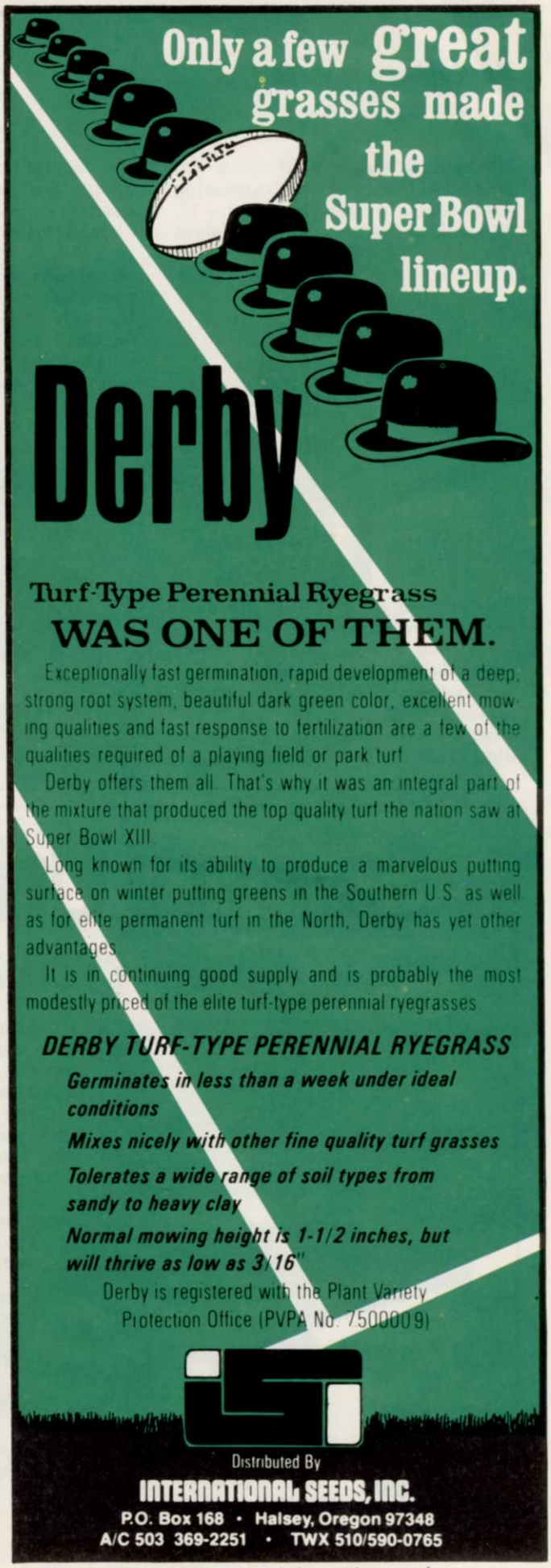
any combination. High tip speed of the 54 heat-treated reversible blades removes runners without lifting turf. The blades are mounted on 18 spiders on 1 9/16-inch centers. One pin and one bolt holds each blade in place, making replacement easy.

Circle 714 on free information card

Each model of the Weed Eater, Inc. series XR trimmer/edgers is powered by a 2-cycle 26.2cc engine positioned at the top for good balance and handling. Each features solid-state electronic ignition.

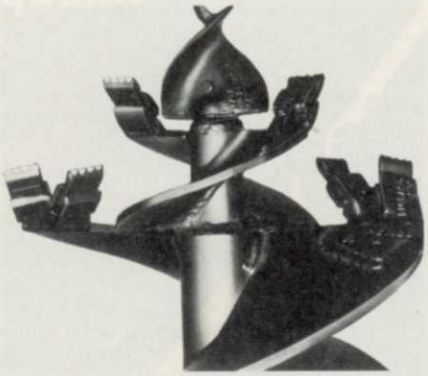
Both the XR-50 and XR-70 have the convenient "Tap-N-Go" cutting head which feeds out additional nylon cutting line when tapped on the ground. The XR-90 has a twin-line cutting head which can be replaced with a metal blade for brush cutting.

Circle 711 on free information card



Circle **104** on free information card

Heavy-duty auger XHD from the McMillen Div. of States Engineering Corp. comes in three diameters — 12, 15, and 18 inches. All three sizes feature a 9-inch pilot drill which precuts the hole for the larger



diameter auger. Helicoid flighting, for strength and low weight, is welded to a 3-inch-diameter steel pipe. Replaceable carbide cutting teeth are standard.

Fixed length or variable length extensions are available for providing digging depths to 8 feet. A collar on the variable length extensions adapts the auger to other digger heads.

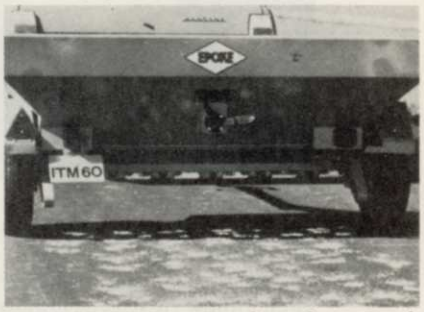
Circle 702 on free information card

Model 5315 "fluid heat" high pressure washer from Northeast Industries, Inc. uses its manufacturer's vertical heat coil and burner design to provide 185 degree F. operating temperature for cleaning at a total output of 1.5 gpm. The lightweight gun and hose reduce operator fatigue and the

metered detergent system helps you save on application.

Circle 703 on free information card

The Epoke TM 60 automatic spreader for ice and snow control has traction drive — no engine and no hydraulics. The Thomsen Products, Inc. equipment lays a uniform pattern on every pass, regardless of wind, terrain, speed, or operator technique. A flow control handle regulates the amount of material to be spread by adjusting the tension of the holding springs. That amount will be

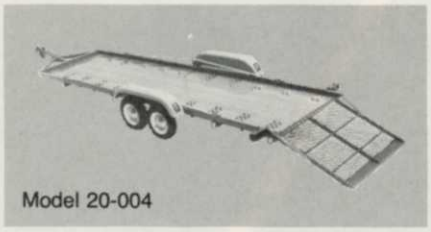


spread, no matter what the speed. The TM 60 weighs 475 pounds, holds .7 cubic yards, and is 74 inches wide. The TM 35 weighs 310 pounds, holds .4 cubic yards, and is 44 inches wide.

Circle 713 on free information card

Snowco Utility Trailers

...now even more versatile!



Model 20-004

Ideal for hauling grounds maintenance equipment, golf cars and other bulky, hard-to-handle items, the proven Snowco line includes eight flatbed trailers with loading ramps or tilt decks, plus a box bed trailer with tailgate.

The design of the popular ramp loading trailers—with perforated steel decks—has been improved for increased versatility. Three models are offered with capacities of 1,150 and 2,100 pounds.

Five tilt trailers with perforated steel decks are offered with capacities of 1,000 to 3,500 pounds.

The steel box bed trailer—capacity 1,200 pounds, is available with an optional canvas or fiberglass cover.

Model 20-006

Snowco
Division of Beatrice Foods Co.
4386 McKinley, Omaha, Nebraska 68112

Please send Utility Trailer information.

Name_____

Organization_____

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Address_____

Phone_____

City_____ State_____ Zip_____

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WT&T CLASSIFIEDS

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

USED EQUIPMENT

HI-RANGER 54' and other aerial buckets. 2 Asplundh brush chippers, Prentice hyd. loader, chipper truck, John Bean 20 g.p.m. sprayer, 4 & 9 ton tag-along trailer. Allied Enterprises, Inc., W204 N11509 Goldendale Rd., Germantown, Wi. 53022. Phone 414 255-6161.

HI-RANGERS AERIAL BASKETS 65', 57', 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560, 6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers. Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. 414 257-1555.

BRUSH CHIPPERS, used Asplundhs, Hydro-Axs and bucket trucks. Lease or for sale. Large inventory available. Call or write P. C. Gould Sales Company, Plains Road, Essex, Conn. 06426. 203 767-1636.

FOR SALE: 10-1977 Chevy one-ton trucks, 750 gal. spray tanks, R & M 3L4 pump, electric hose reels, spray hose, ready to spray. Phone 513 845-0631.

STAINLESS STEEL COMBINE that rolls, aerates, applies seed plus liquid and granular chemicals. Call 301 987-5901.

FOR SALE: 1970 International tandem, rear mount Barko 60 loader, new rubber, steel bed, newer engine, many new parts. $11,950.00. 312 354-1181.

1965 F800 FORD, 361-V8, 5 speed with 14' steel platform deck, with 1968 "G" OBC Prentice log loader. Good condition. Call 914 561-3490.

ARLO TELESCOPIC CRANE 100 ft. mounted on 1967 Ford 700. New cables powerd by Miller Welder. All mint condition. $10,000. Queens Tree Service, Queens, N.Y. 212 849-5140 after 6 P.M.

1976 DITCH WITCH R-100 trencher w/6 way back fill blade. Option laser attachment for placing drain tile. This machine is in excellent condition, only 480 hours. Call 219 879-3606.

1977 PRINCETON self-propelled sod harvester, diesel engine, low hours, $25,000.00. 402 624-6385.

SEEDS

SOD QUALITY Seeds: Adelphi, Glade, Cheri, Nugget, Merion, Fylking, Majestic, Baron & Touchdown bluegrasses, also fine fescues. Manhattan ryegrass. Custom mixing available. Michigan State Seed, Grand Ledge, Michigan 48837. Phone 517 627-2164.

LAWN SEED. Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44314. Call collect 216 753-2259.

TURF GRASS SEEDS. All improved varieties suitable for Canadian conditions, custom mixtures, and Prill-On coated seeds. Oseco, Inc., P.O. Box 219, Brampton, Ontario, Canada, L6V 2L2. Phone 416 846-5080.

HELP WANTED

POSITION AVAILABLE coordinating sod growing and sales on two farms; some travel; southern U.S.; background in horticulture or agronomy. Salary plus bonus. Please send complete resume to Box 231, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

CHEMICAL LAWN CARE company needs working foreman with at least three years experience in turf management including supervision, sales, customer and employee relations. Must have mechanical background. 214 690-1900. Lawn Doctor, P.O. Box 30121, Dallas, TX 75230.

TREE CREW LEADERS and Tree Trimmers, qualified, to do utility line clearing needed in our Mountain States Division and other areas. Crew leader applicants must have good record of successful crew operation. Send letter showing qualifications and references with address and phone number to: Personnel Director, Wright Tree Service, Inc., P.O. Box 1718, Des Moines, Iowa 50306. An equal opportunity employer.

LANDSCAPE CONSTRUCTION and maintenance supervisor wanted. Chicago area firm has openings with responsibilities and salary commensurate with experience and abilities. Send resume and salary requirements to Martin Landscaping Company, 209 Main St., Prairie View, IL 60069. 312 634-1660.

TURF SPECIALIST/MANAGER TRAINEE positions open at expanding chemical lawn and shrub care company in fast growing Houston, Texas. Tremendous opportunity for those having experience with national or regional lawn care companies, or knowledge of turfgrass and ornamental plants. The right people will have unlimited advancement potential. Send complete resume including education, experience and salary history to: Environmental Lawn Care, 7544 Harwin, Houston, Texas 77036 or call collect 713 784-1750.

ONE OF AMERICA'S leading pest control company is looking for salesmen plus salesmanagers with a proven track record in selling, "quality not price". Excellent base salary incentive program, car, gas, plus fringe benefits. Write or call Karl Amalia, Director, Sales Development, Big State Pest Control, 1260 Shotwell, Houston, Texas. 713 675-3451. Replies will be held in strictest confidence.

WORKING FIELD FOREMAN with knowledge of landscape business. Must take charge of complete operation and crews. Good business background essential. Salary plus bonus negotiable. Resume and salary requirements to Bluemel's Landscape Service, 4930 West Loomis Road, Milwaukee, Wisconsin 53220.

DO TO RAPID EXPANSION the Excelawn Corporation of America is seeking qualified individuals to fill full time position which are currently open in production, sales and service areas in Chicago, Illinois, Indianapolis, Indiana and Louisville, Kentucky. A successful applicant should have a B.S. degree or equivalent education and experience in Agronomy or horticulture with emphasis in turf science. Excelawn currently ranks in the top 5% of all lawn care companies in the U.S. and is committed to continued rapid expansion. We are able to offer to qualified individuals key promotion to supervisory as well as middle or upper management positions in the near future.

TREE TRUCKS

(22) 1970-72 GMC 5500 series with crew cabs and dump chip boxes. Running condition but all need minor repairs. $2,300 to $2,900.

(15) 1967-70 GMC tree trucks (same as above) All need major repairs. Value lies in crew cab and chip box, $1,200 to $1,600.

(5) 1972 Int. 1800 series 14' grain, trash or fire wood body dump, $5,000 each.

OPDYKE'S AUTO SALES
Rt. 309
Colmar, Pa. (Phil. area)
215 822-8300

Salary and benefits commensurate with the individuals qualifications. Send resume in confidence to Excelawn Corporation of America, Corporate Headquarters, P.O. Box 372, Crestwood, Kentucky 40014, Attn: Ernest Sampson.

LAWN CARE MANAGER—We are looking for a take charge person experienced in all aspects of lawn care. This person will supervise daily operations in a rapidly expanding lawn care company in the far western suburbs of Chicago. Applicant should have a B.S. degree or equivalent in one of the Agronomic sciences, a totally professional view of the lawn care industry, and the desire to be an intrical part of a professional team. Salary will be commensurate with experience. Please send a complete resume including education, experience, and salary history to: Village Green Limited, 303 Wilson Ave., West Chicago, Illinois 60185, or call collect 312 293-1036.

TREE CARE MANAGER—We are looking for someone experienced in the feeding and spraying of trees and ornamentals. You will handle sales and service in this newly opened division of our established lawn care company. This position offers excellent opportunities for advancement for the dynamic individual. Applicants should have a B.S. degree or equivalent in one of the horticultural sciences. Please send a complete resume including education, experience, and salary history to: Village Green Limited, 303 Wilson Ave., West Chicago, Illinois 60185, or call collect 312 293-1036.

WANTED: Experienced turfgrass irrigation sales and design personnel. Rapidly growing Toro distributor in Colorado has openings for qualified people. Send resume in confidence to Mr. Folk, L.L. Johnson Distributing Company, 4700 Holly Street, Denver, Colorado 80216.

FOR SALE

TWO LAWN SPRAYING SERVICES in central Illinois 35 miles apart. Over $110,000 volume, 2 Ford F600 1200 gallon trucks, 1 F600 Ford flatbed, 1 F100 Ford, 2 300 gallon Bean sprayers, 1 200 gallon Bean sprayer, 2000 & 3000 gallon storage tanks on flatbed, 1500 gallon fiberglass storage tanks, misc. equipment. Will sell together or individually. Write Box 235, Weeds Trees & Turf, Box 6951, Cleveland, Ohio 44101.

TREE, SHRUB, Lawn spraying service established 30 years, eastern Idaho growing community. Seasonal: April—November, grossing $40,000.00. Manager retiring. 3 spray trucks, all accounts. $70,000.00. Contact main office 206 525-2223. 1115 N. 94th Street, Seattle, Wash. 98103.

BUSINESS OPPORTUNITIES

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. McKay Golf & Country Club Properties, 15553 N. East St., Lansing, Michigan 48906. Phone 517 484-7726.

LEARN LANDSCAPING and the growing of plants at home. Start a satisfying business or hobby. Free booklet. Lifetime Career Schools, Dept. A-821, 2251 Barry Avenue, Los Angeles, Ca. 90064.

WANTED TO BUY

USED BRUSH CHIPPER and stump cutter in good condition. Contact Ray Hallford, Tree Doctor, P.O. Box 30121, Dallas, Texas 75230. 214 690-1945.

WANTED: A TS66 Vermeer mounted on truck in workable condition. Send price quote with particulars to: LDC Houston, P.O. Box 42062, Houston, TX 77042, Attn: Ron Smith.

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WT&T EVENTS

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 9800 Detroit Ave., Cleveland, OH 44102.

Basic Short Course in Horticulture— Brentwood Theater, Veterans Administration, West Los Angeles, CA, **Feb. 5, 12, and 19;** Diamond Bar Country Club, Diamond Bar, CA, **Feb. 6, 13, and 20;** UC Cooperative Extension Office, San Bernardino, CA, **Feb. 7, 14 and 21.** Contact Ed McNeill, Registration Coordinator, Horticultural Education Fund, 1000 Concha St., Altadena, CA 91001, 213-798-1715.

Annual Turf & Landscape Conference, Tappan Zee Inn, Mountain View Ave., Nyack, NY, **Jan. 30.** Contact: Frank Claps, 136 Laurel Ave., Larchmont, NY 10538, 914-834-6846.

16th Turfgrass and Environmental Landscape Exposition, San Mateo County Fairgrounds, San Mateo, CA, **Jan. 30-31.** Contact Emory Hunter, Chairman, NCTC, P.O. Box 268, Lafayette, CA 94549.

Virginia Turfgrass Conference, Fort Magruder Inn, Williamsburg, VA, **Jan. 30-31.** Contact: J.F. Shoulders, Ext. Specialist-Turf, College of Agriculture and Life Sciences, Virginia Polytechnic and State University, Blacksburg, VA 24061.

ALCA Annual Meeting and Trade Exhibit, Town and Country Hotel, San Diego, CA, **Feb. 3-8.** Contact: Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102, 703-821-8611.

United States Golf Association Regional Turf Conferences, **Feb. 4** Myrtle Beach Hilton, Myrtle Bech, SC; **Feb. 6** Quality Inn, Cypress Gardens, FL; **Mar. 3** Phoenix Country Club, Phoenix, AZ; **Mar. 6** Holiday Inn West, Billings, MT; **Mar. 7** Broadmoor Golf Club, Seattle, WA; **Mar. 11** Lakeside Country Club, Houston, TX; **Mar. 13** James River Country Club, Virginia Beach, VA; **Mar. 18** Westchester Country Club, Rye, NY; **Mar. 20** Oakmont Country Club, Pittsburgh, PA. Contact USGA, Far Hills, NJ 07931, 201/766-7822.

Colorado Nurserymen's Association Nursery Conference, Denver Merchandise Mart, 451 East 58th Ave., Denver, CO, **Feb. 4-6.** Contact Cary G. Hall, Executive Secretary, Colorado Nurserymen's Association, 10775 North 65th St., Longmont, Co 80501.

Wastewater Irrigation Course, Denver, CO, **Feb. 5-7.** Contact: The Irrigation Association, 13975 Connecticut Ave., Silver Spring, MD, 20906, 301-871-8188.

National Arborist Association Winter Meeting, Orlando Hyatt House, Orlando, FL, **Feb. 17-21.** Contact: Bob Felix, 3537 Stratford Rd., Wantagh, NY 11793, 516-221-3082.

Residential Landscape Design Course III, Ohio Agricultural Research and Development Center, Wooster, OH, **Feb. 20-22.** Contact Fred K. Buscher, Area Extension Agent, Horticulture, Area Extension Center, O.A.R.D.C., Wooster, OH 44691, 216/262-8176.

Northwest Pest Control Conference on Integrated Pest Management, Spokane Sheraton Hotel, Spokane, WA, **Feb. 22-25.** Contact: Chris Senske, P.O. Box 6258, Kennewick, WA 99336, 509-783-5461.

First Agri-Turf Irrigation Exposition and Technical Conference, Houston, TX, **Feb. 24-27.** Contact: The Irrigation Association, 13975 Connecticut Ave., Silver Spring, MD, 20906, 301-871-8188.

American Sod Producers Association Winter Meeting, Disney World, Orlando, FL, **Feb. 24-28.** Contact: ASPA, 9th and Minnesota, Hastings, NE, 68901, 402-463-5691.

Pennsylvania Turfgrass Conference, Hershey Motor Lodge and Convention Center, Hershey, PA, **Feb. 26-29.** Contact: Arthur Wick, P.O. Box 362, Sewickley, PA, 15143 or Christine King, Pennsylvania Turfgrass Council, 412 Blanchard St., Bellefonte, PA 16823.

Connecticut Groundskeepers Association, Conference, Hartford Civic Center, Hartford, CT, **Feb. 27.** Contact: Glenn Moore, 141 Hemlock Hill Rd, New Canaan, CT, 06840.

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Iowa Turfgrass Conference, Des Moines Hilton Inn, Des Moines, IA, **Mar. 3-5.** Contact: Ed Cott, Dept. of Horticulture, Iowa State University, Ames, IA, 50011.

Midwest Turf Conference, Stewart Center, Purdue University, **Mar. 3-5.** Contact: W.H. Daniel, Dept. of Agronomy, Purdue University, W. Lafayette, IN 47907.

12th Annual Professional Turf and Plant Conference, Salisbury Restaurant, Eisenhower Park, East Meadow, Long Island, NY, **Mar. 4.** Contact Waldemar Solovieff, 63 Central Ave., Amityville, NY 11701.

Ninth Vertebrate Pest Conference and ASTM Symposium, Hilton Hotel, Fresno, CA, **Mar. 4-7.** Contact: Jerry Clark, 1220 N. Street, Room A-357, Sacramento, CA 95814.

Canadian Turfgrass 31st Annual Show, Skyline Hotel, Toronto, Canada, **Mar. 9-12.** Contact: Canadian Golf Superintendents Association, 698 Weston Rd., Suite 32, Toronto, Ontario, Canada, M6N 3R3, 416-767-2550.

Northeastern Forest Pest Council Meeting, Holiday Inn Downtown, Portland, ME **Mar. 11-12.** Contact: James Nichols, Bureau of Forestry, 34 Airport Drive, Middletown, PA, 17057.

National Lawn Care Business Conference and Trade Show, Red Carpet Hotel, Milwaukee, WI, **Mar. 16-19.** Contact Lawn Care Conference, Box 1936, Appleton, WI 54913, 414/7332301.

1980 Landscape Industry Show, Long Beach Convention Center, Long Beach, CA, **Apr. 3-4.** Contact: Landscape Industry Show, 3671 W. MacArthur Blvd., Suite 500, Santa Ana, CA 92704.

Garden Symposium, Williamsburg, VA, **Apr. 13-16.** Contact Mrs. Peggy W. Sabol, Registrar, The Colonial Williamsburg Foundation, Williamsburg, VA 23185, 804/229-1000.

New Jersey Recreation and Park Association Annual Conference, Golden Eagle Inn, Cape May, NJ, **Apr.27-29.** Contact Gary J. Forbes, President, 530 Turnpike, Pompton Plains, NJ 07444

Les Floralies Internationales de Montreal, May 17-29. Contact Les Floralies Internationales de Montreal, Dommissiare General, 360 Rue St-Jacques, Suite 310, Montreal, Quebec, Canada, H2Y 1P5.

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